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FORMERLY

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MORE TO OUR LIKING

It was with no small degree of satisfaction that we examined U. S. Department of Agriculture Circular 338, "Parasites and Parasitic Diseases of Dogs," by Dr. Maurice C. Hall. It is a pleasure to state that this publication contains practically nothing to which any veterinarian in fairness could object. On the other hand, the frequent references to the need for and value of skilled veterinary services should leave no doubt, in the mind of any dog owner, that the treatment of any form of parasitism is safest and most satisfactory when entrusted to competent hands—trained veterinarians.

Dr. Hall is a veterinarian as well as a zoologist. He knows veterinarians just about as well as he knows worms. His constant association with practicing veterinarians all over the country has made him familiar with their problems. His knowledge of dogs, parasites, and drugs enables him fully to appreciate the dangers of possible combinations of these three factors in incompetent and untrained hands. Therefore, some of the statements appearing throughout the circular.

After emphasizing the importance of controlling parasites, Dr. Hall says:

"Medical treatment is the business of the veterinarian, not of the dog owner. It involves the niceties of accurate diagnosis, a matter that calls for special training, medical skill, and adequate experience, things which the dog owner is not likely to possess. Errors in diagnosis mean misdirected efforts, with the possibility of injury to the sick animal, loss of time and money, and the possibility that this lost time will allow the real condition to go unrecognized until it is too late to save the animal. Treatment also involves the use of highly potent drugs, carefully selected with due regard to the end to be accomplished, and administered in such doses and in such a way as to cure disease without injuring the patient. The possible contraindications for treatment, conditions which make it evident that certain drugs or doses are dangerous, must be ascertained and kept in mind. The anthelmintics (drugs used to remove worms) are always poisonous, being intended to poison the worms, and must be given in such doses as will accomplish that object without materially injuring the patient. Insecticides injudiciously applied to the skin to kill parasites may injure the skin or kill the patient. In this discussion of parasites, a number of treatments are described, since in some cases it will be necessary for an owner to treat his dogs, owing to the fact that there are no competent veterinarians available. It is understood, of course, that an owner gives such treatment at his own risk, and that he assumes the responsibility for his diagnosis, selection of drugs, dosage, method of administration and technic, and the risk of possible bad results. Each dog presents his own special individual case, and no general directions can cover all of the possibilities. Passing judgment on the individual case is precisely where the skilled veterinarian becomes indispensable, and whenever possible he should be employed."

Throughout the circular, frequent reference is made to the veterinarian, and reasons given why it is desirable to rely upon the veterinarian, not only for appropriate treatment, but for accurate diagnosis. The whole circular has such a different tone to it, as compared with another to which we had occasion to refer in these columns some months ago, that we can not refrain from commenting on it at some length. We are a firm believer in the doctrine of giving credit where credit is due.

MECHANICAL COWS AND SYNTHETIC MILK

A recent statement attributed to Henry Ford has stirred up quite a commotion among the dairy interests. The motor magnate is reported to have criticized the dairy industry as cumbersome, unprofitable, and wasteful of time and material. The dairy cow came in for her share of criticism, and was characterized as an "inefficient machine." The question of synthetic milk was also re-introduced in the reported interview.

We did not have long to wait for somebody to come to Bossy's defense. Dr. C. H. Eckles, of the University of Minnesota, who knows just as much about cows and milk as Mr. Ford knows about flivvers and gasoline, is authority for the statement that the dairy cow is a more efficient worker than the automobile, and that this statement is borne out by data compiled by

engineers, who say that only 15 per cent of the actual power of gasoline is used in propelling an automobile along the road.

Speaking of synthetic milk, Mr. Ford is reported to have said that it will be cheaper and better than the milk we now have. The cow is to be eliminated entirely from the operation. The raw materials, now consumed by the cow, will be dumped into one end of a machine—to be the product of somebody's chemical and mechanical ingenuity—and out of the other end will come the finished product—synthetic milk.

A BARNYARD REVOLUTION *Pittsburgh Sun*

Mr. Ford, of course, is not alone in his idea. Mr. Charles F. Kettering, who has to his credit a number of very important inventions which are used extensively in the automobile industry, was recently quoted as saying that, "Soon a cow will be a museum piece. In fifty years, we shall make our milk and beefsteak in the laboratory. Mr. Kettering believes that the utilization of solar energy will be an important factor in these developments.

Nowadays, when a prediction is made that we are due for some revolutionary change, we rather dislike to scoff at the idea. The present generation has seen put to practical use a

number of so-called "hare-brained" ideas of the previous generation, and we no longer are apt to say, "It can't be done." Some of the things which "could not be done" a quarter of a century ago are being done today, and hardly receive more than passing notice.

The fact remains, however, that one of the hardest things to improve upon is Nature, and with that thought in mind, we are inclined to the opinion that the dairy cow will be here when most of us have passed on. Nature is sometimes provokingly slow in revealing her secrets, and some of those in connection with digestion, absorption, metabolism, and particularly the biochemistry of a secretion like milk, are no exceptions to the rule. Granted that chemical ingenuity may solve the question from the scientific standpoint, it will still remain for someone to place the process on a practical basis. In spite of opinions to the contrary, we consider the cow quite practical.

COOPERATION APPRECIATED

For about a year, the Eastern Iowa Veterinary Association has had a very energetic Committee on Publicity. One of the functions of the Committee has been to furnish information relative to the prevalence of infectious diseases of animals in Eastern Iowa.

To show how well this service is appreciated, we reproduce an editorial which recently appeared in the Davenport (Iowa) *Democrat and Leader*, under the caption, "Veterinarians Performing a Public Service":

> "Every week, there comes to The Democrat a bulletin from the Eastern Iowa Veterinary Association, telling just where losses are being caused in Eastern Iowa by diseases which might be further spread among Iowa hogs and cattle, unless publicity is given to their existence in certain localities.
>
> "The veterinarians of Eastern Iowa might have more to do if they helped to spread disease among Iowa farms. Instead, they seek to help prevent its spread by fair warning of its existence and by helping farmers to provide the ounce of prevention that is worth a pound of cure.
>
> "So those who have observed the progress of public health movements for many years know that the medical fraternity is most active in advocating the preventive measures that would help to make this a healthier world. One cannot live to himself alone, and those who know most of the threat of disease, to animals or men, reflect credit upon their profession when they take the lead in combating it by those preventive measures that save more lives, every year, than skill or medicine can."

We also reproduce one of the bulletins referred to in the foregoing editorial, to show just what information is given to the public.

INFECTIOUS DISEASES IN EASTERN IOWA

"Infectious diseases of animals in Eastern Iowa caused losses during the past week on farms in the vicinity of the following places:

"*Hemorrhagic septicemia of cattle:* Lowden, Keystone, Hopkinton, Ryan, Manchester.

"*Blackleg of young cattle:* DeWitt, Traer.

"*Hog cholera of swine.* Toledo, Elvira, DeWitt, Elwood, Delmar, South English, Keystone, Independence."

STUDENT ENROLLMENT FOR 1925-26

Reports received from the deans of the various veterinary colleges indicate a slight increase in the total enrollment of veterinary students, as well as a slight increase in the number of freshmen, as compared with one year ago. The returns show that the total number of veterinary students is 602, as against 591 for 1924-25, and 172 freshmen compared with 169 last year.

Colorado, Cornell, Iowa, and Ontario show slight gains this year, making up some or all of their losses last year. At Alabama, Georgia, and Michigan, the situation is reversed, these three institutions losing their gains made last year. Kansas, Pennsylvania, and Washington continued to make gains, while Montreal, Ohio, and Texas lost more ground.

Considering the amount of effort spent the past year by various agencies to attract the right kind of young men into the veterinary profession, the results, as indicated by the number of freshmen students enrolled, are somewhat disappointing. As we have pointed out on frequent occasions, the number of men being graduated each year is less than the number of men lost to the profession each year by death alone. During the next three years, there will be graduated only approximately four hundred veterinarians from all the colleges in the United States and Canada, about seven men for each state and province in these two countries.

	Fresh.	Soph.	Jun.	Sen.	Spec.	Total	1924-5	Change
Alabama P. I.	4	4	3	5	0	16	22	— 6
Colorado Agr. Coll.	10	10	15	12	1	48	36	+12
Cornell University	24	18	26	20	2	90	76	+14
Georgia State Coll.	3	6	2	6	0	17	23	— 6
Iowa State College	35	14	26	15	0	90	88	+ 2
Kansas St. Agr. Coll.	21	14	10	11	2	58	55	+ 3
Michigan St. Coll.	4	7	6	11	4	32	38	— 6
Montreal, Univ. de	5	5	2	5	1	18	19	— 1
Ohio State Univ.	17	9	7	21	1	55	64	— 9
Ontario Vet. Coll.	20	23	14	12	1	70	68	+ 2
Penna., Univ. of	15	23	9	10	1	58	55	+ 3
Texas A. & M. Coll.	1	1	4	5	0	11	20	— 9
Washington, St. Coll. of	13	12	5	8	1	39	27	+12
	172	146	129	141	14	602	591	+11

TEXAS SITUATION IN HAND

Most recent reports relative to the foot-and-mouth disease outbreak in Texas would indicate that the situation is well in hand. This has not been brought about, however, without some rather strenuous work. During the latter part of September, the progress of the work was interrupted by temporary injunctions granted to dairymen and hay contractors against the Texas Live Stock Sanitary Commission. These injunctions had the effect of preventing the enforcement of quarantine regulations.

Just as soon as the other states sensed the situation, some twelve or more of them quarantined against the entire state of Texas, for their own protection. The English government did the same. Under date of September 24, a telegraphic request was received by Secretary Jardine from Governor Ferguson, to have the Bureau of Animal Industry take full charge of the work of eradicating foot-and-mouth disease in Texas. This was agreed to only after the dissolution of the injunctions. Following the removal of these injunctions, the various state embargoes, as well as that of the British government, were modified so that they applied only to the federal quarantine areas, consisting of some nineteen Texas counties.

Up to October 20, the infection had been found in fifty herds, all of which were located in two counties, Harris and Galveston. The herd in which the disease was found most recently (October 14) was destroyed the following day.

The number of animals destroyed since the beginning of the outbreak and up to the close of October 16, according to figures given by Dr. J. R. Mohler, chief of the Bureau of Animal Industry, is as follows:

Cattle	21,263
Sheep	1,452
Swine	619
Goats	272

The injunctions obtained by certain dairymen in Texas, who could not see the wisdom and practicability of the slaughter method of combating foot-and-mouth disease, occasioned no particular surprise upon the part of live stock sanitary officials, although the interruption of the work was necessarily quite annoying. Until such time as our lay owners of live stock are

completely "sold" on the slaughter method, we can expect to have objections raised. All that we have to do, however, is to compare our method with the methods which have been used in other countries in their efforts to handle foot-and-mouth disease. Commenting upon this subject in a recent communication, Dr. Mohler quoted from a recent report received from the commission sent to Europe by the Bureau of Animal Industry to study foot-and-mouth disease. The portion of the report quoted by Dr. Mohler is as follows:

> "We desire to emphasize that at this writing we are of the opinion more than ever before that the U. S. should do all in its power to prevent the disease from getting a foothold, and thus becoming enzootic, as it is now in continental Europe.
>
> "In Europe they are simply up against it, * * *. Some countries like Switzerland and Sweden make strenuous efforts to keep the disease in check in spite of all obstacles, while the majority of countries visited feel that they can do no more than impose a very ineffective quarantine and take the consequences.
>
> "It is extremely doubtful whether it would be possible with the severest form of quarantine to prevent an extensive spread of the disease to practically all parts of the United States.
>
> "Switzerland enforces very strict quarantine measures, in some instances covering large territories. In such communities, the people are prohibited from having direct intercourse with free areas. Food, mail, and other necessities of life are brought to them by special officers, for eight weeks after the recovery of the last case. In the United States the direct cost of similar methods would be tremendous and the indirect cost to farmers and other interests would be staggering and would be many times the cost of our present methods * * *.
>
> "European officials with whom we have discussed methods of combating foot-and-mouth disease agree that situated as we are and the disease limited to only a comparatively small percentage of animals, the slaughter and clean-up method is the only effective one and is the most economical. They can not adopt this method because the disease is so widespread all over Europe that slaughtering would be futile in most cases on account of their geographical situation * * *.
>
> "Until more definite information is at hand to point out under which condition the virus is soon destroyed, and which are the conditions which make it possible for the virus to remain active, and point out which animal may and which does not harbor the infection, we must consider that all recovered cases are possible carriers, even if the percentage of such cases is small and we must consider that virus may live a considerable length of time outside of the animal body under some condition, and we must continue our methods of eradication while it is still possible to do so. Otherwise we will find outselves in the same condition as Europe and South America find themselves, saddled with the foot-and-mouth disease."

"The only conclusion that can be drawn from this statement," said Dr. Mohler, "is that until the pathology of foot-and-mouth disease is better understood, the slaughter method is the only practicable one for this country."

With which sentiments we most heartily agree.

ANOTHER BOOKLET READY

Every member of the Association has been sent a copy of a booklet entitled, "Nothing to Sell but His Services." The purpose of this booklet is just this: It has been published to meet a demand, coming particularly from our practitioners, for something that could be enclosed with a bill or a statement or a letter, going to a client or any owner of live stock, telling a little something about what a veterinarian is. The booklet is one of a series, to be published at intervals.

Just as the booklet, "The Veterinarian. Who is He? What is He? What of His Future?" was intended for family consumption—among ourselves—this second booklet is intended for the most widespread distribution possible. We have arranged for printing the booklet in large quantities, as needed. Members will be charged actual cost—one dollar per hundred, postage included. If by any chance you have not received a copy, do not hesitate to ask for one.

Let us have your opinions on this booklet. We would also like to have suggestions for other booklets of the series. Do you like the idea? Do you think that this particular kind of publicity will produce results? Do not hesitate to express your opinions. It will be helpful in shaping our plans along this line.

FOWL PEST SITUATION

Under date of October 6, 1925, Dr. J. R. Mohler, chief of the Bureau of Animal Industry, issued the following statement relative to the present status of fowl pest in the United States:

"We have, as you probably know, a number of stations in charge of animal disease and meat inspection work in each of the chicken-raising states. The veterinary inspectors performing the service under these stations are keeping in close touch with the producers, distributors, and slaughterers of poultry in their districts and advising the Bureau whenever any unusual losses occur. When such losses are reported, we detail employees experienced in poultry disease work to investigate conditions and to secure specimens for laboratory examination and tests if such procedure seems advisable.

"Since last spring we have been able to confirm a diagnosis of fowl pest only in New York and Delaware. In the former state the disease made its appearance about July 1, in a flock of 900 chickens near East Hampton, on Long Island. In the latter, about 200 chickens on a farm near Dover, Delaware, were involved. The usual slaughter and disinfection methods were employed in combating these outbreaks.

"Numerous investigations have been made during the past two months in the central western states, but in all instances our findings have been that the losses, which in a few shipments have been quite heavy, have been due to some of the common ailments, such as roup, or to dietetic disturbances, apparently the result of hardships attending the transporta-

tion of the birds, aggravated by improper feeding and confinement in insanitary quarters.

"We are doing our utmost to impress on those engaged in concentrating and distributing poultry the importance of maintaining their plants and equipment in a sanitary condition and improving their feeding practices. In our opinion some progress is being made, but much remains to be done in this respect. You may be assured however, that all reports of heavy losses in poultry are being promptly investigated and that we are prepared to act quickly in the event there should be a recurrence of either fowl pest or infectious bronchitis."

APPLICATIONS FOR MEMBERSHIP

(See October, 1925, JOURNAL)

FIRST LISTING

BESCOBY, FELIX HAROLD 5242 W. Washington Blvd., Los Angeles, Calif.
B. V. Sc., Ontario Veterinary College, 1919
Vouchers: C. A. White and W. R. Carr.

CHAMBERLAIN, J. F. 703 So. Choctow, El Reno, Okla.
D. V. M., George Washington University, 1914
Vouchers: H. W. Wilson and F. F. Meads.

LAMES, H. S. La Porte City, Iowa
D. V. M., Iowa State College, 1925
Vouchers: C. H. Stange and W. F. Guard.

LEBISH, JACOB 887 Melrose Ave., Bronx, N. Y.
D. V. S., New York University, 1919
Vouchers: C. G. Rohrer and J. F. DeVine.

McMURRAY, ARTHUR A. 105 State Office Bldg., Trenton, N. J.
D. V. M., Ohio State College, 1924
Vouchers: Henry H. Haigh and J. H. McNeil.

ONISSIMENKO, VASSILY NICOLAEVICH Makawao, Maui, Hawaii.
V. S., Veterinary College Dorpat, Russia, 1893
Vouchers: P. H. Browning and I. Charlton Fitzgerald.

OSORIO, RAFAEL A. la Filomeno Mata No. 6, Mexico, D. F., Mex.
M. V., National School of Vet. Med. of Mexico, 1916
Vouchers: L. Santa Maria and H. Preston Hoskins.

PARSON, ARTHUR THEODORE Warren, Pa.
B. V. Sc., Ontario Veterinary College, 1914
Vouchers: E. E. Bittles and T. E. Munce.

RAU, BENJAMIN Vet. Hospital, 39th St. & Woodland Ave., Phila., Pa.
V. M. D., University of Pennsylvania, 1925
Vouchers: William J. Lentz and G. A. Dick.

STEVENS, V. H. 143 So. Commercial St., Steubenville, Ohio
D. V. M., Cincinnati Veterinary College, 1914
Vouchers: A. C. Dunlap and W. A. Axby.

Applications Pending

SECOND LISTING

Button, R. A., 2909 So. "M" St., Tacoma, Wash.
Carrico, J. E., Bicknell, Ind.
Fell, Harvey Lewis, 1025 N. Clayton St., Wilmington, Del.
Guerrero, Roberto Plata, Sinaloa 42, Mexico, D. F., Mexico.
Matteson, Joseph S., Parnell, Mo.
Miller, N. Jay, Box 245, Eaton, Colo.
Spore, Jesse E., Patoka, Ind.
Witt, Bernhard, Scribner, Nebr.

REFERRED TO EXECUTIVE BOARD

Hendriksen, Alfred, Burlington, Wash.
Miller, Stephen T., 502 So. Wenatchee Ave., Wenatchee, Wash.

COMING VETERINARY MEETINGS

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York, N. Y. Nov. 4, 1925. Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.

Connecticut Veterinary Medical Association. Hotel Garde, New Haven, Conn. Nov. 4, 1925. Dr. Geo. E. Corwin, Secretary, 11 Warrenton Ave., Hartford, Conn.

Southeastern States Veterinary Medical Association. Henry Grady Hotel, Atlanta, Ga. Nov. 9-10, 1925. Dr. John I. Handley, Secretary, P. O. Box 1533, Atlanta, Ga.

Southwestern Michigan Veterinary Medical Association. Kalamazoo, Mich. Nov. 12, 1925. Dr. Geo. McCollister, Secretary, Kalamazoo, Mich.

Conestoga Veterinary Club. Stevens House, Lancaster, Pa. Nov. 12, 1925. Dr. Henry S. Weber, Secretary, 27 E. Liberty St., Lancaster, Pa.

Massachusetts Veterinary Association. American House, Boston, Mass. Nov. 25, 1925. Dr. H. W. Jakeman, Secretary, 44 Bromfield St., Boston, Mass.

U. S. Live Stock Sanitary Association, LaSalle Hotel, Chicago, Ill. Dec. 2-3-4, 1925. Dr. O. E. Dyson, Secretary, 923 Exchange Bldg., Kansas City, Mo.

Central Michigan Veterinary Medical Association. Jackson, Mich. Dec. 3, 1925. Dr. W. M. Armstrong, Secretary, Concord, Mich.

Illinois State Veterinary Medical Association. Chicago, Ill. Dec. 4, 1925. Dr. L. A. Merillat, Secretary, 1827 So. Wabash Ave., Chicago, Ill.

Nebraska State Veterinary Medical Association. Omaha, Nebr. Dec. 8-9, 1925. Dr. F. R. Woodring, Secretary, Lincoln, Nebr.

First District (Ohio) Veterinary Association. Milford Center, Ohio. Dec. 10, 1925. Dr. H. H. Kettler, Secretary, Milford Center, Ohio.

Delaware Veterinary Medical Association. University of Delaware, Newark, Del. Dec. 18, 1925. Dr. C. C. Palmer, Secretary, Newark, Del.

WORTH IT

King Richard was willing to sacrifice his kingdom for a horse, all of which leads us to believe that was the only way he could get his car out of the mud.—(Detroit *Times*).

TICK PARALYSIS*

By E. A. BRUCE,

Animal Pathologist, Health of Animals Branch, Department of Agriculture, Agassiz, British Columbia

This interesting condition is not perhaps as well known as it might be and, although we have nothing original to offer, it is felt that the subject is not inappropriate for a meeting of western veterinarians, many of whom must have come from tick-infested territory.

In Australia a motor paralysis, affecting chiefly children and dogs, has been shown by Dodd to be due to the tick *Ixodes holocyclus*, and a similar condition in sheep is reported in South Africa as being due to *Ixodes pilosus*. In North America the tick *Dermacentor venustus* Banks is the cause of such a disease in man, sheep and occasionally in dogs and cattle. Possibly other species of animals may be affected but of this we have no direct evidence. In addition to causing paralysis *D. venustus* has been shown to be the carrier of Rocky Mountain spotted fever and, comparatively recently, of tularemia. It is therefore a tick of prime importance to all concerned.

Up to the present time we have no records of either spotted fever or tularemia occurring in Canada. It is a matter, however, that will have to be borne in mind, especially *Bacterium tularense* infection, as it has recently been shown by Parker, Spencer and Francis, that this disease can be carried, not only by the tick *D. venustus*, but also by the common rabbit tick *Haemaphysalis leporis-palustris*, which has a wide distribution.

Historical

In 1912 Todd published some notes on cases of paralysis associated with tick bites occurring in children in British Columbia. He stated: "These notes are made public in the hope that they may induce physicians who have seen or who may see similar cases to publish their experience, for it seems possible that an undescribed disease, caused by ticks, may occur in British Columbia. The subject demands investigation."

*Presented at the sixty-second annual meeting of the American Veterinary Medical Association, Portland, Oregon, July 21-24, 1925.

Published by permission of Dr. George Hilton, Veterinary Director General, and Dr. E. A. Watson, Chief Pathologist, Health of Animals Branch, Ottawa, Canada.

In the same year Dr. I. U. Temple read a paper on the subject before the Eastern Oregon District Medical Society. In 1913 Hadwen showed experimentally that *D. venustus* could paralyze lambs, and the same year, in conjunction with Nuttall, showed that it was possible to produce a similar condition in the dog.

Distribution

Dermacentor venustus occurs in California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington and Wyoming. In Canada it is confined to the drier sections of southeastern British Columbia and the southwest corner of Alberta. A few specimens have been found on animals imported into southwestern British Columbia, but have never become a pest, as conditions are not suitable for their life cycle. The furthest north these ticks have been found up to the present is about 100 miles north of Kamloops, B. C.

Seasonal Prevalence

In British Columbia tick paralysis is essentially a disease of early spring. It occurs occasionally as early as the latter part of February, is common in March and April, and rarely seen after the middle of May. A paralysis occurring in the *summer* months and affecting cattle and sheep in tick districts, and at one time thought by some to be due to ticks, has been shown experimentally by the writer to be a poisoning due to the ingestion of *Astragulus campestris.* (Not yet published.)

Life History of D. Venustus

There are four distinct stages of development: the egg, the larva or seed tick, the nymph or middle-sized tick, and the adult (male and female). This tick feeds only on the blood of mammals, and requires three hosts to complete its development. Under natural conditions *D. venustus* seldom completes its cycle from egg to adult under two years and may take three or four. Under laboratory conditions it is possible to carry them through this cycle in a few months, but it is apparently not possible to rear them through more than one generation in a calendar year.

In the spring the adult ticks attach themselves to the larger animals, chiefly horses, cattle and sheep. They may also be found on the pig and dog and on a number of different wild animals, such as jack rabbits, showshoe rabbits, porcupines, mountain goat and sheep, woodchucks, bears, coyotes, badgers, deer, etc. While on the host the sexes mate, prior to which the

male feeds for about three days. The female feeds from five to fifteen days, usually about ten, and increases in weight some five or six hundred times. When fully gorged she drops off and, after an interval of from 6 to 84 days, starts ovipositing. The oviposition period lasts from 15 to 40 days, the eggs, from 2000 to 7000 in number, being deposited on the ground under rocks and litter. The female may survive one to fourteen days after the eggs are laid.

In from 14 to 51 days the eggs hatch, producing the larval or seed ticks which are six-legged and somewhat smaller than the head of a pin. The larval ticks feed only on the blood of rodents, such as ground squirrels, deer mice, field mice, jack rabbits, cottontail rabbits, snowshoe rabbits, chipmunks, pack rats, etc. Unfed larval ticks usually die in 30 days but have been known to live 117 days. Very few, however, survive the winter. Those that find a host feed from two to eight days and then drop to the ground. After a period of from 8 to 26 days or longer, the engorged larva moults and emerges as a nymph or middle-sized tick, which has eight legs but is sexually immature.

The nymphs seek and feed on the same kind of hosts as the larval ticks. They feed from four to ten days before dropping to the ground. Unfed nymphs may live over 300 days. The engorged nymphs moult in from 12 to 170 days and emerge as adults, males and females. Adults captured in the spring, on vegetation, have survived unfed for 413 days and, after fasting 365 days, readily attach themselves to a host.

Conditions under Which Paralysis Occurs

We are of the opinion that paralysis results only when ticks are gorging fast. The male ticks, which have a habit of attaching and reattaching a number of times, do not appear to be a factor. The females feed from five to fifteen days and, in view of the fact that a single female can, upon occasion, produce paralysis and even death, it is evident that such ticks must be either carrying some infection or that they secrete some toxic substance. The negative inoculations, absence of fever and rapid recovery are against infection. On the hypothesis that symptoms are due to a toxin produced while feeding, it would seem that this is either produced only when gorging fast, or that under such conditions of feeding the toxin is injected into the body in a greater amount than it can accommodate in a given period of time.

Insofar as sheep are concerned, animals in which the condition

occurs most commonly in British Columbia, paralysis may occur in any year if they are pastured on tick-infested territory. In some years, however, more cases may develop than in others, and although the number of ticks present is a factor, it is thought that this variation is largely due to the condition of the animals and to prevailing climatic conditions. If the wool contains a lot of yolk it will be noticed that the ticks are slow in moving and that many of them die on the animal, presumably because their spiracles have been blocked with grease.

That temperature has a bearing on the number of paralyzed cases is advanced by one of my correspondents (T. A. Moilliet). It is claimed that more cases develop when there is an extreme range between the maximum and minimum daily temperatures, and it is suggested that this induces a healthy appetite in the gorging female. As the gentleman in question is a sheep-rancher, an amateur entomologist and has charge of the local meteorological station, he is in a good position to make this interesting observation.

It will be noted that we have emphasized the importance of the gorging female. We do so because in all human cases there is such a tick present and often only one, and also because a paralyzed sheep will recover if rapidly gorging females are removed, although no attention be paid to hundreds of ungorged or partly gorged males or females.

Symptoms in Animals

It should be borne in mind that this is a disease of the spring season.

Sheep: The first noticeable symptom is restlessness, followed by a staggering gait. The animal may have difficulty in avoiding obstacles and may fall. A little later it falls and cannot rise, but struggles a great deal. As paralysis advances it ceases to struggle. One case is reported that was down nine days but in untreated flocks the average is about two days. An animal may appear perfectly all right, an hour later be staggering, twenty minutes later be completely paralyzed, and two hours later be on its feet again.

Treatment consists in removing the gorged females, which will be found chiefly about the head, neck and within an inch or two of the backbone. The region above the hocks and knees should also be examined. Recovery usually takes place within four

hours, sometimes within two. If there is no improvement it should be examined again. The temperature remains normal, but the pulse may be weak. The eyes are bright and the appetite, except in extreme cases, unimpaired.

Dogs: We have not much information on cases in dogs. Incoordination, lack of energy and drowsiness, which disappeared after the removal of a tick, have been reported. In the experimental case reported by Hadwen and Nuttall, a single *D. venustus* female, placed on a dog, attached the second day. On the ninth day, "symptoms of paralysis appeared, hind quarters affected; dog very restless and falling about when attempting to walk. Front legs fairly under control. Sensation in hind legs unimpaired but movements incoordinate." On the tenth day, "front limbs affected; dog could only raise his head a little, incontinence of urine. Loss of appetite." On the eleventh to thirteenth days, "dog looking very ill, breathing laboured, had to be fed, paralysis persisting. On the fourteenth day, "symptoms subsiding," on the fifteenth, "almost well," and on the sixteenth, "dog as well as ever, can run and jump over obstacles." On the eighteenth day, "tick removed, about two-thirds gorged."

In this interesting case it is evident that the tick fed for a longer period than usual and was not fully gorged when removed. This does not, however, upset the theory that symptoms were produced by some toxic substance given off by the tick during the time it was feeding rapidly, and that had it continued to feed to repletion, the dog would probably have died.

Cattle: While it is not uncommon to find *D. venustus* ticks on cattle, judging from the Montana reports, their number may vary considerably. Their favoured places of attachment are the brisket, dewlap, the back, and occasionally the tail. In two fatal cases, reported in 1922, the ticks were attached chiefly at the base of the skull and near the spine. With the exception of these two cases we do not know definitely of any losses attributable to ticks, although the condition is perhaps not so rare as was once thought. In this connection we note the Montana authorities mention "down with ticks" is a local designation for a condition of unknown etiology which occasionally occurs in tick-infested cattle. The animal is found lying down and unable to rise. If the ticks are removed and the animal is given proper care, recovery usually follows."

Effect of Tick Bite on Man

A number of cases of paralysis, due to the tick *D. venustus*, have been reported by physicians in the infested areas of British Columbia. Most of these have been in children, but it has been seen in a boy of eighteen and twice in adult men. At least one fatal case has occurred this year in British Columbia, but I have been unable to secure particulars. Such cases are not so common as they were a few years ago, because children are examined more closely during the tick season than they used to be. In view of the well-marked symptoms presented in man, it is to be regretted that fatal cases should occur at all, as they probably would not, if the knowledge that ticks can cause paralysis was more generally known.

The symptoms in general are those of an ascending motor paralysis. They may vary slightly in individual cases but are usually as follows: The patient, apparently well one day, may on the next complain of a numbness of the feet and legs, and have difficulty in walking; in a few hours may be unable to stand. The hands and arms are usually affected next. Difficulty in swallowing may be next noticed. The tongue becoming affected, there is difficulty in articulation; it may be impossible to protrude the tongue or, if protruding, to withdraw it. Mucus may collect in the throat with apparent choking, but vomiting does not occur as a rule. Constitutional symptoms are slight; there may be some restlessness in the early stages or the patient may complain of feeling "a bit seedy." In the case of an adult, he described his condition as resembling that of being partially "drunk." There is no pain, the temperature usually remains normal, and the pulse may be normal or faster than usual.

Two cases have been reported in which some anesthetic areas were found over the inner surface of the thighs and in one over the posterior surface of the humerus as well, and in both cases there was a slight rash on the chest. Recovery in these, as well as in most cases, started a few hours after the tick was removed and was complete in three or four days. With the exception of the two cases mentioned, which were unusual, it may be said that the sensory nerves are not involved in tick paralysis, it being essentially a disease of the motor system; the special senses are not involved.

The time elapsing from the beginning of symptoms to complete paralysis and even death, may be less than two days, but as a

rule takes from three to five. The prognosis is favorable if paralysis has not progressed so far as to affect the heart or respiration. While recovery as a rule is rapid and complete, it is necessary that care be exercised in removing the tick, as should the tick's false head (capitulum) remain behind, it is liable to set up a pruritus that may last for months; indolent ulcers or abscesses may also form.

While the ticks may be found attached to any part of the body, they are usually found on the upper trunk and generally on the head. The gorged female by this time will be bluish in color and about the size of a bean, and should be found with comparative ease. They may be induced to let go by covering them with any oil or grease, which has the effect of blocking their breathing apparatus, situated just back of the fourth pair of legs. If necessary, the small piece of skin containing the head can be nipped off with a pair of scissors; in any event it should not be left in the skin.

Immunity

It has been said, and we ourselves are guilty, that immunity follows paralysis due to *D. venustus*. It is now felt, however, that this statement needs further consideration. At the present time we would say that this matter is not definitely settled. We have a record of several sheep having been affected the second time in one season and we are advised of another ewe that was affected three times in one season. We have no definite record of any animal being affected in more than any one year. One of my correspondents (T. A. M.), who does not agree that an immunity exists, bases his opinion on the fact that in a flock of 300 sheep, from one to five years of age, with a 100 per cent lamb crop, run on tick country three years out of five, the average number affected each year was from 10 to 25 per cent, there being just as many cases among the older sheep as among the lambs.

The argument advanced is, that if an immunity existed, one would expect a greater number of lambs than sheep to be affected, as the lambs had of course not been previously exposed. This, in our opinion, is reasonable and, in view of the previous cases mentioned as being affected more than once in a season, we feel that more definite data must be obtained before we can claim an immunity following the paralysis due to this tick. The scarcity of cases in human adults, as compared with children, would indicate however, that age is a factor.

Ticks on Horses. D. Albipictus

While *D. venustus* is commonly found on horses, it is not as plentiful on such animals as the tick *Dermacentor albipictus*. This tick is slightly larger and lighter in color than *D. venustus*. *D. albipictus* is a common species throughout the northern United States and its distribution covers the breadth of Canada. However, it is not any more common on the coastal section of British Columbia than is *D. venustus*, presumably because the climate is too moist for larval development.

D. albipictus is a one-host tick and is found on its host during the late autumn, winter and early spring, hence its common name of "the winter tick." Its chief hosts are horses, cattle, moose, elk, deer and mountain goats.

Economic Importance

In 1913 Bishopp and Wood stated:

> *D. albipictus* has been considered of little or no importance until very recently. During these investigations we have found the tick to be an important pest of horses and cattle during the autumn, winter, and early spring. The tick is much more severe on horses than cattle, mainly owing to the preference shown for the former animal as a host. Reports have been received from California, Montana, and Oregon stating that horses and colts become very weak and that colts not infrequently succumb if the ticks are not promptly killed. During the spring, in territory infested by the Rocky Mountain spotted fever tick (*D. venustus*), the combined attack of these two species, together with a shortage of feed, often cause the death of numbers of horses where they are not properly cared for."

In British Columbia we have had, at various times, reports of ticks killing horses, but the most interesting report came from a rancher in the Okanagan Valley, and in this case the ticks were identified as *D. albipictus*. Information received was to the effect that:

> "I have lost about twenty head of horses this winter (letter dated March 25th) mainly through this pest which has infested my stock by the thousands. This is the ninth winter I have been in the Okanagan and I have never seen them so bad before. All the symptoms were alike —horses became so weak they could not get on their feet after lying down, they seemed stiffened up behind."

As *D. albipictus* is a one-host tick, it is very much more easily controlled than *D. venustus*. Dipping in the early spring, if possible, before the ticks drop off and in the late autumn are recommended. Hadwen has suggested that the bites of these ticks may be an important factor in the occurrence of outbreaks of fistulous withers and poll evil among unbroken range horses. While these ticks may cause a certain amount of trouble we have no information at the present that would connect them with tick paralysis, tularemia, or Rocky Mountain spotted fever.

Dermacentor Venustus and Tularemia

Infection by *Bacterium tularense* Francis has been noted from the Pacific to the Atlantic coasts, and can be carried by a number of vectors—by the bed bug, squirrel flea (*Ceratophyllus acutus*), deer fly (*Crysops discalis*), rabbit louse (*Hemodipsus ventricosus*), the rabbit tick (*Haemaphysalis leporis-palustris*), and by the spotted fever tick *D. venustus*.

Insofar as *D. venustus* is concerned, from evidence secured by Parker, Spencer and Francis, in Montana, it appears that infection can be carried from the larval to nymphal stage, and from the latter to the adult, and that the survival of infection in the adult of at least eight months' duration is indicated. We are also advised, by Dr. R. R. Parker, that the excreta of such ticks is infectious.

The hosts of *D. venustus* known to be susceptible to tularemia infection are jack, snowshoe and cottontail rabbits, and woodchucks (*Marmota flaviventer*). The ground squirrels, *Citellus beecheyi*, *C. mollis*, and *Ammospermophilus leucurus*, are known to be susceptible, but data concerning their relationship to the tick are lacking, and of other rodent hosts of the tick data are lacking as regards susceptibility. Of the large mammals, which are the principal adult tick hosts, none is known to be susceptible with the possible exception of sheep.*

The possibility of sheep being affected with tularemia is interesting, and we understand that this phase of the matter is now receiving attention by the Montana authorities. There seems to be no question that heavy tularemia mortality among rabbits may have an influence on the number of tick-paralysis cases occurring in certain years, not because tularemia and tick paralysis are identical, but simply because there would be that many less tick hosts and, consequently, less ticks.

While tularemia epidemics may occur among rabbits, it has not as yet been shown that this infection is responsible for the losses occurring among such animals in cycles of six or seven years. Periodic losses of rabbits occur in British Columbia, but up to the present we have no evidence to show that tularemia occurs in the Province, nor do such losses appear to influence the number of tick-paralysis cases, as they occur outside as well as in *D. venustus* areas, and when in such areas other hosts are abundant.

*Pub. Health Rep., May 9, 1924.

Tularemia in man is usually chronic in character and may last for weeks or months. It is accompanied by chills, headache, nausea, and marked prostration. The temperature is usually highest about the time of onset and within a few days thereafter, with a gradual decline to normal. Fever usually lasts two or three weeks, sometimes longer, and recovery is slow. Glandular involvement is likely to be present, and if infection follows the bite of a tick or other vector the glands draining the area are most likely affected. The point of inoculation may show necrosis. Glandular involvement is often absent in laboratory cases. That the disease is highly infectious is evident from the large number of laboratory workers who have been affected.

D. Venustus and Rocky Mountain Spotted Fever

Spotted fever is an acute febrile affection, with a tendency to stupor. The eruption, which appears about the third to fifth day is not unlike that of typhus fever and tends to become hemorrhagic. The disease extends throughout the northwestern states and as far south as northern California. It has not been reported from Canada so far as we know.

The infecting organism, *Dermacentroxenus rickettsi* Wolbach, is found chiefly in the endothelial cells of the blood-vessels of the skin and genitalia. It is transmitted by the tick *D. venustus*. All stages of the tick may be infective. The infection has been shown in the eggs of infected females. Ticks have been found infective for seventeen months, which is approximately the maximum life period of an unfed adult.

In addition to the guinea pig and the Belgian hare, the following animals are known to be susceptible to the disease: the ground squirrel (*Citellus columbianus*), the rock squirrel or side-striped squirrel (*Callospermophilus lateralis cinerascens*), the chipmunk (*Eutamias luteiventris*), the mountain rat or pack rat (*Neotoma cinerea*), the weasel (*Putorius arizonensis*), the showshoe rabbit (*Lepus bairdi*), the cottontail rabbit (*Sylvilagus nuttalli*), and the prairie dog of eastern Montana (*Cynomys ludovicianus*). The jack rabbit (*Lepus townsendi campanius*) is also suspected.

Local Distribution and Habits of D. Venustus

The following matter is taken from the Fourth Biennial Report of the Montana State Board of Entomology:

> Given equivalent adult host conditions, the abundance of ticks in any locality is dependent upon the character of the vegetation or of the soil covering, that is, whether timber, open timber, jack pine, cut-over stump land, cultivated land, rocky land, etc. It is this character of the soil cov-

ering which not only determines the species of rodents but also their relative abundance.

For example, showshoe rabbits are practically restricted to jack pine thicket areas, woodchucks to rough talus slopes, etc. Thus it is evident that given any particular type of country the ticks present may be presumed to have developed on the inhabiting species of rodents. For example, on waste open slopes ground squirrels predominate and most ticks present will have fed as larvae and nymphs on ground squirrels. Similarly in jack pine thicket areas most ticks will doubtless have fed on snowshoe rabbits, while in woodchuck areas woodchucks will have been largely responsible. From the spotted fever standpoint this fact is of great importance, because there is every reason to believe that the source of infection is to be found in certain species of rodents and since the distribution of the disease is restricted to certain types of country, it is reasonable to assume that rodents inhabiting those areas in which the fever occurs are much more likely to be associated with its occurrence than are those inhabiting types of country in which the fever is not present. This explains why spotted fever may be common to certain localities and not in others, although *D. venustus* occurs in both. Further, if the source of infection can be definitely placed in any given locality the control of spotted fever is greatly simplified. Investigations concerning the habits of ticks have demonstrated a tendency of adults to migrate down hill. Under such conditions they are frequently found collected on the up-slope side of trails, which they seem indisposed to cross. It has further been found that the factor determining the dropping of engorged seed ticks is the degree of light intensity. The more intense the light the more rapidly do they drop. These facts have a bearing on the distribution of infected ticks, particularly the reaction of the engorged seeds to light. Nymphs doubtless have the same habit. To illustrate, a non-burrowing animal of nocturnal feeding habits will drop its ticks where it stays during the day. If such an animal should prove to be the real source of the disease, it may help to explain the apparent localization of infection. The snowshoe rabbits would fall in this category. During the day they are found in jack pine thicket country which is suspected as being the most likely type of country to harbor infected ticks. Certainly, then, any ticks dropping from them, whether infected or not, will be kept localized in areas of the jack pine thicket type.

In the Third Biennial Report we find:

To further show the differences that exist in different regions and that knowledge of one locality may be almost useless in another, the habits of adults in attaching to the domestic animals may be noted. In the Bitter Root Valley the ticks on horses are essentially confined to the under side of the jaw and between the fore and hing legs, while on cattle they are found along the back. In eastern Montana, ticks on horses are found mainly in the places above noted but also to a considerable extent in the tail and under the fetlocks, and on cattle they occur on the dewlaps, in the tail and occasionally on the udder (I have never found them on the back). (Parker)

Control of D. Venustus

Those especially interested in this phase of the subject are referred to the excellent reports of the Montana State Board of Entomology. In general it can be said there are two main lines of attack: the control of the adult ticks, and control of the immature ticks through the rodents upon thich they feed.

Methods applicable to adult ticks are:

(a) The restriction of grazing on infested areas during the season of adult tick activity (the end of February to the first of

July), many ticks thus being starved to death, and egg-laying being prevented.

(b) The use of repellents on domestic animals, to prevent ticks attaching. Oils such as cottonseed and raw linseed have been tried with fair success.

(c) Dipping, especially with arsenical dips.

(d) The application, directly, of toxic substances, such as kerosene and lard, turpentine and lard, etc. In this connection it might be mentioned that the writer once saw a 60 per cent creolin solution (strong enough to blister the hands) used on sheep, and while this killed unattached ticks it did not kill those that were already attached. In general, it would seem that a preparation of an oily nature is the best.

Methods applicable to immature ticks consist in the extermination of the rodent hosts of such ticks, which is best effected through the use of poisoned bait such as the following:

> Dissolve one teaspoon of saccharine and one ounce of bicarbonate of soda in four quarts of water. Add a half pound of gloss starch and heat the mixture until it is thick, but do not cook. Keep stirring all the time. To this solution add one ounce of powdered strychnin and mix well. Pour this mixture over twelve quarts of whole oats or eight quarts of crushed oats, and mix so that the grain is thoroughly coated. About a teaspoonful of this should be placed near each gopher hole and, for preference, on clean hard ground.

Burning: Some reference to burning is necessary because of the confidence many farmers place on this method of control. There is no question but that burning results in the destruction of a greater or less percentage of ticks and it is equally certain that it does not destroy them all. Direct evidence to this effect was obtained in Montana, through the accidental burning over of an area on which marked ticks had been placed for experimental purposes. Some dead marked ticks were found, but also some marked ones that survived. Burning cannot be considered as anything more than an accessory control measure, its indirect value through the cleaning and clearing of land being as great or greater than its value by the actual destruction of ticks.

Furthermore, it should be borne in mind that burning, such as will be most effective, is rarely accomplished and that rocky areas where ticks are frequently most abundant cannot be burned at all.

Conclusion

While the tick *Demacentor venustus* Banks (*D. andersoni* Stiles) may carry the organisms of Rocky Mountain spotted fever and of tularemia, it can also, under certain conditions, which appear

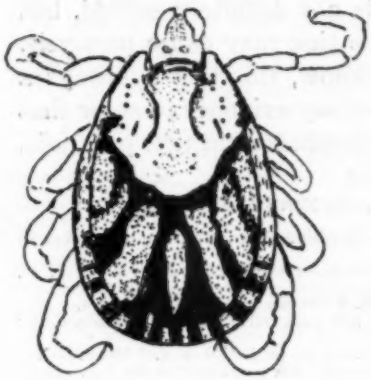

Fig. 1.

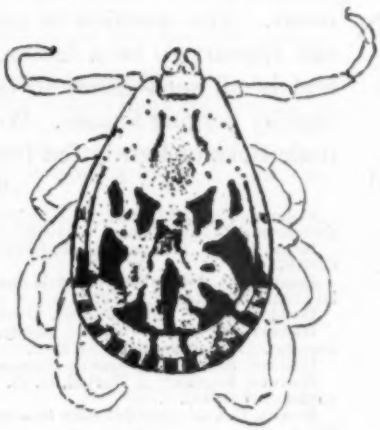

Fig. 2

Fig. 3

Fig. 4.

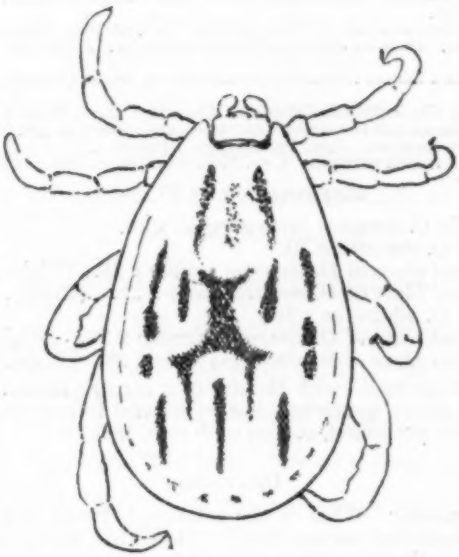

Fig. 5.

Fig. 6.

Fig. 7.

PLATE 1

to be governed by the rate of engorgement, produce a motor paralysis of an ascending type in man, sheep, dogs and cattle. Recovery is usually rapid and complete, but fatal cases may occur. The question of immunity is not definitely settled, but age appears to be a factor. A single tick may cause paralysis, and in all such cases, so far as we know, this tick is always a rapidly gorging female. We have not any evidence to show that male ticks or lightly fed females are implicated in tick paralysis.

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EXPLANATION OF PLATE 1

Fig. 1. Female *D. venustus* (unengorged) x 10.
Fig. 2. Male *D. venustus* x 10.
Fig. 3. Stigmal plate of *D. venustus* female x 28. (Right).
Fig. 4. Stigmal plate of *D. venustus* male x 28. (Right).
Fig. 5. Male *D. albipictus* x 10.
Fig. 6. Stigmal plate of *D. albipictus* female x 28. (Right).
Fig. 7. Stigmal plate of *D. albipictus* male x 28. (Right).

NOTE.—Drawings made with the aid of a camera lucida. The pattern of individual ticks varies somewhat, but in general follows the scheme shown. The stigmal plates are found, one on each side, just back of the fourth pair of legs.

DISCUSSION

DR. J. P. IVERSON: What is the relation between the number of ticks found on the animals that succumb and on those that merely contract paralysis?

DR. BRUCE: Only one tick is necessary. In addition to sheep we may occasionally get cases in cattle, but sheep are the commonest and in such animals it is unlikely that you find only one tick, but often, in human cases you will find only one and some of these are fatal cases.

DR. IVERSON: What is the length of time after being placed on the subject that one tick takes to produce symptoms of the disease?

DR. BRUCE: Usually, I would say, the tick has been on for five or six days and then begins to feed fast. As soon as she begins to feed rapidly paralysis starts to develop and you may have death within two days from the time

symptoms were first noticed. Of course the tick may start feeding fast and then slack off.

DR. A. EICHHORN: Have you done any work on the etiology of this?

DR. BRUCE: I have not. Hadwen and Nuttall did some work in England but they were not able to find out what was at the bottom of the trouble. The lack of fever, negative inoculations, and rapid recovery are against infection.

DR. N. F. WILLIAMS: Is transmission of tularemia found?

DR. BRUCE: Merely the handling of affected material will transmit it, in fact I understand it is exceedingly dangerous to handle. The tick is not the only vector in transmitting it to the human, as the common rabbit louse and other vectors can pass it. You can also get it—according to Dr. Parker—by handling affected ticks, as the excreta is infectious.

DR. JAGGER: Is it possible for ticks to be on a human for several days without finding it out?

DR. BRUCE: It is. We hear of ticks burying themselves under the skin, in reality they do not burrow under the skin but the skin swells and comes up around the tick. The tick cannot live once it gets its breathing apparatus under the skin.

DR. S. B. FOSTER: In the removal of the individual tick from the human, after application of oil, how long does it take before it drops off?

DR. BRUCE: It may take fifteen minutes before it lets go. If there is any doubt of the head remaining behind, it is well to nip off the affected skin rather than let the head remain. Sometimes touching the tick with the hot end of a cigarette may cause it to let go.

DR. FOSTER: Here, we are bothered with the wood tick. We get good results with a drop of chloroform. The head comes out in three or four minutes. You interfere with its breathing and it is paralyzed; it works out and lets go.

BUREAU TRANSFERS

Dr. William C. Herrold (McK. '07), from Omaha, Nebr., to Lincoln, Nebr., in charge of tuberculosis eradication, hog cholera control, and field inspection.

Dr. Earl R. Fisher, from Omaha, Nebr., to Sioux Falls, Iowa, on meat inspection.

Dr. Lewis Bilikam (San. Fran. '17), from Tacoma, Wash., to San Franscico, Calif., on meat inspection.

Dr. Willis G. Benner (Ont. '90), from Sacramento, Calif., to Baltimore, Md., on tuberculosis eradication.

Dr. Andrew L. Walsh (Chi. '20), from Sioux Falls, Iowa, to South St. Paul, Minn., on meat inspection.

Dr. Garrie W. Riley (U. P. '12), from Washington, N. C., to Wheeling, W. Va., on meat inspection.

Dr. Ralph F. Vermilya (Chi. '06), from South St. Paul, Minn., to Wheeling, W. Va., in charge of meat inspection.

Dr. Geo. D. Jelen (O. S. U. '23), from Detroit, Mich., to Columbus, Ohio, on meat inspection.

Dr. Henry R. Schrumpf (Ind. '23), from Cleveland, Ohio, to Indianapolis, Ind., on meat inspection.

Dr. Rudolph Greene (U. S. C. V. S. '20), from South St. Paul, Minn., to National Stock Yards, Ill., on meat inspection.

Dr. Floyd Hill, from National Stock Yards, Ill., to Cleveland, Ohio, on meat inspection.

Dr. Edward F. Jameson (K. C. V. C. '06), from Wheeling, W. Va., to Detroit, Mich., on meat inspection.

Dr. R. W. Culbert (McK. '08), from South St. Joseph, Mo., to Washington, D. C., as traveling inspector, Meat Inspection Division.

Dr. B. J. Stockler (O. S. U. '08), from Wheeling, W. Va., to South St. Joseph, Mo., in charge meat inspection.

Dr. John M. Young (N. Y.-Amer. '03), from Jersey City, N. J., to Brooklyn, N. Y., on meat inspection.

STATE MEAT INSPECTION*

By J. P. IVERSON,

Chief, Division of Animal Industry, Sacramento, Calif.

The present standard of civilization and scientific advancement have lengthened materially the average span of life. No contribution to the creation of this gratifying situation has been of greater importance than the standardization of essential food elements. These vital properties are frequently contained in commodities which under improper conditions are injurious to human health. To prevent consumption of harmful products, means have been devised for their elimination from our food supply. The protection thus afforded the public has taken the form of various systems of inspection illustrated in the operation of meat inspection laws and ordinances.

These diversified measures, directed against the sale of unwholesome meat, resulted from attempts made years ago by communities to devise a practicable plan to prevent the spread of disease through the consumption of unhealthful meat. The result of these endeavors was not always satisfactory but the motive in each instance created a sentiment which often grew to such proportion that sanitary methods in the production of meat for public consumption became a national problem. The solution was partially reached by the enactment of a federal meat inspection law in 1890, amended in 1906. Enforcement of this measure ensures the wholesomeness of meats produced in establishments engaged in interstate or export business, but it affords no protection to the consumer of meats prepared and sold exclusively within the borders of a state.

After the federal meat inspection system was well established, its limitations were recognized by the chief of the U. S. Bureau of Animal Industry, who pointed out that the federal meat inspection law can reach only the interstate article of commerce and urged extension of this sanitary measure so as to afford adequate protection to all meat consumers. To the writer's knowledge this timely advice did not result in concerted efforts to solve this important problem in any state. This country, therefore, is faced with an unbalanced situation in the matter of a wholesome meat supply. At the one extreme we have

*Presented at the sixty-second annual meeting of the American Veterinary Medical Association, Portland, Oregon, July 21-24, 1925.

provided the most complete system of meat supervision now in existence, a protection, however, afforded only to consumers of meat prepared for interstate shipment. At the other extreme we observe the efforts of certain cities to maintain supervision over their local meat supply. Between the extremes is a wide breach in which is produced an unsupervised, unstandardized, public meat supply, prepared in a desultory manner. In rural sections and in most cities it is a reflection on our boasted intelligence and present standard of living that anyone can engage in the business of slaughtering animals for food without semblance of supervision. This problem has remained unsolved although headway has been made in some local areas.

Need Long Recognized

The long recognized need for a system of state meat inspection, like many other important projects, has been permitted to drag without taking definite shape. This condition existed in California until 1915, when the legislature passed the first state meat inspection law. This act gave the state veterinarian authority to supervise the output of any slaughtering establishment, provided the owner made application for inspection, maintained a required standard of sanitation and paid a designated fee. A few progressive slaughterers took advantage of this law and operated their establishments under state inspection. The system was improved by the enactment of the California Meat Inspection Law, in 1921. At the time the bill was introduced it was realized that a request for a heavy appropriation to support the work would be unavailing; therefore, its proponents hit upon the plan of dividing the cost by requiring the slaughterer to pay a fee to maintain a part of this service, the remainder to be supported by appropriation. The idea was advanced that the principle of local option could be applied to meat inspection and this procedure would permit a city or county to enjoy the system of meat inspection provided the citizens so desired.

Briefly the law provides authority for the Department of Agriculture to maintain supervision over all slaughtering establishments in California, except those operating under federal inspection or under existing, city-meat-inspection ordinances. Authority was delegated to the Department to maintain a continuous supervision of the products of any slaughtering establishment, provided the owner paid the designated fee, maintained a proper standard of sanitation and observed the regulations.

The law further provided for the unrestricted sale of state-inspected meats within any portion of the state of California.

Thus it will be seen that the procedure necessary to be followed, in order to obtain a complete supply of inspected meat in a city or county, was comparatively simple. It merely required the passage of an ordinance forbidding the sale of uninspected meats within the municipal or county limits. The passage of such an ordinance made it mandatory for slaughterers, desiring to do business in the area, to make application to the State Department of Agriculture for continuous postmortem inspection. Before this could be granted, the premises, of necessity, were required to meet a sanitary standard. Since the law became effective the authorities of many municipalities and a number of counties have recognized its value, with the result that ordinances have been passed making it possible to afford meat consumers of such communities the needed protection against the sale of unwholesome meat. The value of the law has not been recognized by cities alone; counties have also passed ordinances making it possible for meat inspection to include the entire county supply.

Law Well Received

The reception the law has been given, wherever applied, is evidence that its operation is meeting general approval. The rapidity with which requests have been received from municipalities not formerly having inspection, and from others maintaining some form of insection, prompts the encouraging statement that within a brief period California can boast of having established an extensive, state-wide, meat-inspection system. At the present time this system has been inaugurated in forty-three cities and two counties and a number of others, from which requests have been received, will be accorded state inspection when certain sanitary requirements of the slaughtering establishments have been reached.

This system has the advantage of enitrely removing the enforcement of meat inspection from local prejudice and influence, the employment of inspectors resting solely with the California Department of Agriculture. Inspection operated solely by municipalities is not in all cases satisfactory. In many places the work consists simply of an examination of meat exposed for sale in markets. Such a system is weak and while it may result in the condemnation of a certain amount of unwholesome or tainted

meat, the average purchaser is usually able to detect and avoid such a product. What is required is an inspection that will protect consumers under conditions in which they cannot protect themselves, namely: by guarding against the sale of meat of diseased animals. Under the system outlined, this is accomplished by maintaining veterinarians to conduct ante- and post-mortem inspection of animals at the time of slaughter.

Inspection may be withdrawn from establishments violating the law or requirements prescribed by the department. The law vests authority in the State Department of Agriculture to condemn products, wholly or in part, produced in any establishments, when such products are found diseased or otherwise unfit for food. Another valuable contribution in the matter of meat inspection is the authority vested in the Department to require establishments not operating under continuous inspection to meet a higher standard of sanitation. In the year 1923 the work resulted in the expenditure of not less than one million dollars by slaughterers in the improvement of their premises. During the year 1924 fully one and one-half million dollars were expended by slaughterers in the building of new establishments and the remodeling of old plants. This work is an extensive part of our meat inspection activities and continues to grow. The Department has prepared plans and blueprints for the benefit of slaughterers when altering buildings or constructing new ones. This service is greatly appreciated by the industry.

Inauguration Opportune

While this desired legislation was somewhat delayed, it was accomplished at a time when conditions sere favorable for bringing to the attention of the public the crying need for such a measure. At that time hide prices were high and some unscrupulous live stock dealers were taking advantage of the situation by purchasing diseased cattle at an extremely low figure and disposing of them for slaughter at outlying points where no municipal inspection was maintained. Even though the carcasses of these animals in some instances did not contain sufficient meat to warrant such transactions, the amount realized on this product, in addition to the value of the hides, yielded a substantial profit. This outstanding irregular practice aided materially in the enactment of a law which gives to the State authority to maintain an efficient inspection in any locality in which it is applied.

When this plan of inspection was under consideration, considerable doubt was expressed concerning its practicability. The progress made since its inauguration, however, has fully justified the methods applied. The growth of the service has been most encouraging as will be shown by the following figures:

Year	*Plants Under Inspection*
July 1, 1921	1
July 1, 1922	20
July 1, 1923	39
July 1, 1924	86
July 1, 1925	88

At the present time sixty-five veterinarians are employed by the State in meat inspection service.

It is felt that this system has aided materially in reducing the gap formerly existing between federal and municipal inspection in California. While it is not regarded as nearly approaching perfection, nevertheless it has been responsible for the production of a higher quality of wholesome meat for the consumer, as well as establishing a standard for the producer and legitimate dealer.

DISCUSSION

DR. S. B. FOSTER: It appears to me that California has made a wonderful advancement in the subject of food hygiene. Government meat inspection is very good as far as it goes, but is not nearly inclusive enough. The Government is inspecting only part of our meat supply and leaves most of the intrastate product uninspected, therefore, I regard state meat inspection necessary in order to include meat prepared at small local establishments, and intended for local distribution.

Cattle indemnity is a weapon to bring in the unregulated plants and get them into line. The indemnity is forfeited unless the carcasses are officially inspected. If owners send their cattle to non-approved plants they forfeit the indemnity. Through this procedure we have effected some extensive improvements in local plants bordering the city, and tried to influence them to come up to the requirements of federal inspection.

DR. N. F. WILLIAMS: The matter of meat inspection is challenging the attention of veterinarians, in all parts of the country, and for this reason: The veterinarian is preeminently qualified to handle that particular phase of public health service. Again, there is an inclination on the part of sanitary engineers to further their own interests by taking advantage of our lack of interest in, or local control of, that field. Their motives are perhaps unselfish. Recognizing a necessity in that field, their interests immediately become as active as ours must become eventually. Meat inspection has not been exercised in some fields as effectively as it should be. Although it is an important veterinary activity, its operation has been controlled by laymen who employ and direct veterinarians. Under such direction the seal of approval has been placed upon meat which was not fit for consumption, in some instances. I think the publication of this paper will be an inspiration to the veterinarians of the country. It will point a road out, and relieve a situation that has become embarrassing in some localities.

DR. R. A. CALDWELL: The slaughter-house inspection has materially assisted in keeping down hog cholera in our county and other diseases that have been scattered over the country from slaughter-houses. The slaughterer is realizing the importance of having inspection and is being careful of what he is buying.

DR. WILLIAMS: Is the system self-supporting?

DR. IVERSON: I did not go into it in detail, but I am glad you asked the question. It is self-supporting to this extent: Any slaughterer, desiring to have an inspection of his plant, if he is merely conducting a slaughtering establishment and no processing, is required to pay a fee of $150 per month to the Department for services. He can pay it quarterly, in advance, to the Department, which supplies brass stamps, etc. It supplies supervision, by maintaining traveling inspectors, who, by the way, have just been put on, two months ago, and whose entire time is devoted to visiting various plants, to unify the work of the men in the field. The Department also pays, by appropriation, for the support of the Chief of the Meat Inspection Bureau—Dr. Gordon, who is not here—and also supplies the necessary forms and stamps and all the office detail. The butcher pays a fee of $150 or, in processing plants, they pay $170, and pay it quarterly in advance.

We have found surprisingly little objection on the part of butchers to the operation of this law. That statement brought to mind what Dr. Murray, inspector-in-charge at Salt Lake City, said after the meeting, about the testing of range cattle in Utah. He said they had discovered that the hardest part of the work was getting at it, in most instances in getting the other people to believe that it can be done. After that was over, the rest of it was not difficult. The same thing is true of the meat inspection proposition. We have had, out of nearly 100 abattoirs under full-time inspection, with the inspector there all the time, operating under the same rules and regulations, almost no objection towards the work. They see the value of it. It shuts out the fly-by-night butcher without any investment in a plant. It standardizes or stabilizes the business and they readily believe they get back many times over what they put in. In addition to that, the stamp of the inspector on the meat permits them to sell any place in California—Oakland, San Francisco or Los Angeles. In other words, it enlarges their market.

Speaking of lay inspectors, in California—in several cities, where systems were established before this law was passed, they were acting under city ordinances—there are a number of lay inspectors in charge of the work. It is not difficult to believe that these men did not regard the operation of this law with favor at all. On the other hand, we have the antagonism of one or two of them and we have the friendship and support of several.

The law has operated quite successfully in California. That does not mean, however, that it will operate equally successfully anywhere else, but the paper was presented with the idea that perhaps those here could carry home an idea that could be applied to their own sections or districts.

A SPECIFIC FOR "WATER COLIC"

DEAR SIR:

I received your address from Mr. Frederic J. Haskin, of Washington. I have a cure for Urine Suppression, it's a piece of cloth, all that is necessary is to step over it. It never fails, bringing the flow within two minutes. It works on bulls and horses, as well as human beings. It's a relief compared to injecting wire to the bladder to bring on the flow of urine. Any kind of cloth will do merely by mixing it with some other thing. It will last a life time. Are you folks willing to buy my remedy for the stoppage of Urine.

Yours truly,

MR. JOE MANCE,

Steubenville, Ohio.

(Forwarded to the JOURNAL, through the kindness of Dr. N. S. Mayo, of the Abbott Laboratories. Any members who are interested should correspond directly with Mr. Mance. We can not vouch for the efficacy of his specific. Joe does not favor sounds. We hope his treatment is as good as it sounds. Editor.)

THE INFLUENCE OF DIET UPON IMMUNITY TO HOG CHOLERA*

By ROBERT JAY

Veterinary Inspector, U. S. B. A. I., Sacramento, Calif.

Since the use of serum and virus to protect hogs against cholera, veterinarians have had many disconcerting experiences; not only in failures to confer immunity against cholera but in actually infecting free herds in the attempt to immunize. Although these losses are of sufficient economic importance to warrant the systematic study of the cause for these failures to immunize, yet we have no record of such an undertaking. Those interested have been left to their own deductions, made from observations and experiences of conditions which prevailed at the time of the break in immunity.

The purpose of this paper is to discuss causes which have been advanced to account for these untoward results in vaccination and to present evidence of the inuflence of diet in its interference with the immunizing process. Many causes for breaks in immunity have been given which were suggested by the conditions prevalent at the time of the break. The question is: Were these conditions incidental or did they have a direct bearing upon suspended immunity?

Causes usually cited, and which we will consider, include:

1. Age of hogs at vaccination.
2. Castration.
3. Parasites.
4. Infective pork scraps.
5. Overfeeding.
6. Insanitation.
7. Improper technic.
8. Avirulent virus in active immunity.
9. Impotent serum in passive immunity.

AGE OF HOGS AT VACCINATION

We have the history of hogs succumbing to cholera which were vaccinated as baby pigs. We also have the history of many hogs vaccinated at one hundred and fifty pounds and up, which have subsequently succumbed to cholera. The same cause which

*Presented at the sixty-second annual meeting of the American Veterinary Medical Association. Portland, Oregon, July 21-24, 1925.

accounts for susceptibility of the vaccinated hog to virus, in the hog vaccinated as a baby pig, also prevails to account for the susceptibility of the hog vaccinated at heavy weights.

The age of the hog at time of treatment does not seem to be a factor in the breaks. The only part that early vaccination plays in regard to breaks, that is apparent, is that baby pigs are more susceptible to disturbances due to dietetic errors. This susceptibility tends to lessen with age.

Vaccination of baby pigs for conferring a lasting immunity is dependable when the sows are properly fed during the gestation period, after farrowing and after weaning. This is apparent by results obtained in garbage plants on the Coast. We have determined that about six weeks is the most practical age, as it is seldom that pigs from immune sows become susceptible to field virus prior to the sixth week. One treatment should suffice. It appears to me that the second treatment after weaning is a needless expense.

Castration

We discourage castration and ringing at the time of vaccination, as such operations divert our attention from the routine of vaccination. Furthermore, it is not consistent with proper technic. However, it has been my custom, when a limited number of hogs are offered for treatment, to castrate what boars were in the bunch at the time. I have never noted any ill effects from the procedure. In order to have a large experience from which to draw conclusions, I have vaccinated hundreds of pigs, two to three days after castration, on the same day, and several days before castration, and have never observed the slightest indication of ill effects.

In recalling the history of herds which broke, castration is so seldom associated with the break that I think we are justified in the conclusion that the association is incidental and cannot be accepted as a cause.

Parasites

Pigs in the Middle West and South are usually infested with ascarids. If they played any part in breaks in immunity we would find the breaks in heavily infested hogs, while the hogs free from parasites of all kinds would be protected. Such is not the case. Grain-fed hogs, put on garbage, soon pass the ascarids and yet we find a greater percentage of breaks attending that change than any other.

Ascaris infection is incidental and there is no evidence to prove that heavy ascaris infestation interferes with antibody formation and, if they do not, there is no reason why the presence of these worms in the intestines should have any effect upon immunity.

Infective Pork Scraps

Since Birch proved that tissue from hogs infected with cholera at the time of slaughter may remain infective after passing through the curing and smoking process, we have accepted, without question, the inference that infective pork scraps in garbage account for the occurence of cholera in garbage-fed hogs. The freedom from hog cholera of many susceptible herds fed raw garbage has led me to doubt the frequency of exposure of hogs on garbage through pork scraps. I have a record from twenty-five feeders who have fed susceptible hogs raw garbage, for from one to fifty years, without cholera once appearing in the hogs.

As we do not know of other means of proving or disproving the infectiveness of suspected material than by the exposure of susceptible hogs, we shall have to conclude that garbage is not continuously infective, but rarely so. The fact that we have serum and virus breaks in garbage-fed hogs, treated with potent serum and virulent virus, is proof conclusive that there is another factor in the feed than virus which accounts for the failures to confer immunity.

Virus in the feed of immune hogs serves to augment active immunity rather than break it. For instance, in 1914 some states prohibited the use of virus in the double treatment of hogs. Some of the farmers whose hogs received serum alone fed carcasses of hogs, which had died of cholera, to confer a more lasting immunity. Insofar as we were able to find out, they were successful. At any rate we did not have knowledge of a single herd which broke as the result of the hogs eating such carcasses.

We must look to processes which actually prevent immune reactions in the vaccinated hog to account for susceptibility, not in exposure of the normal immune hog to virus.

It seems to me that we can eliminate the virus which may be in pork scraps as being a factor in the breaks. Pardon a little diversion from the subject of breaks in immunity in reference to the source of infection in cholera outbreaks. Pork scraps are given as the source of infection in garbage-fed hogs without the slightest proof of the infectiveness of the garbage, while the

most searching investigation will fail to reveal the source of infection in hogs on other feeds. May it not have been possible that the hogs on garbage became infected through the same unknown source?

The element of uncertainty should at least be recognized. We are without knowledge of the biological characteristics of hog cholera virus. We do not know the natural carrier of this virus. Therefore, to attempt to fix the source of infection in cholera outbreaks, without knowledge of direct exposure, is mere conjecture. To consider the exposure of a vaccinated hog to virus as a cause for a break in immunity strikes me as ridiculous.

Overfeeding

Some feeders in the Middle West take pigs off self-feeders and vaccinate and turn the pigs back on the self-feeders without interference with the immunizing process. The pigs had been started on a self-feeder before weaning as soon as they could eat and were in a thrifty condition at the time of treatment and normal metabolic functions were maintained during the immunizing process. Therefore there was no serum break. Evidently it is not the overfeeding, when normal metabolic activity is maintained, that can be held accountable for breaks in immunity.

Insanitation

We all urge sanitary measures as a routine precaution for the control of diseases which are filth-borne and also for its psychological effect. However the indications are that hog cholera is not a filth-borne disease. Experiments tend to show that the most natural destructive agents of virus are fermentation and putrefaction, which take place in organic matter.

There is a question in my mind whether or not we would not more effectively destroy the virus of cholera, which may remain on the premises following an outbreak, by piling up the litter and feces for a period of time, to encourage more thorough destruction through these natural processes, than to resort to spraying with sheep-dip solutions, which would tend to arrest putrefaction and thereby tend to preserve virus.

Sanitation, to be effective in the control of a particular disease, must be directed at the prevention of the cause coming into contact with the susceptible body. As we do not know what hog cholera virus is, nor how it is transmitted naturally, we do not know the possibility of control through sanitation. For

instance, of what avail would the most stringent sanitary precautions be in preventing malaria, unless directed at the prevention of contact with the infective mosquito?

Pending knowledge of what hog cholera virus is and how it is transmitted, we recommend vaccination as a routine procedure in those herds where we have reason to fear exposure to virus during the life of the hog. To place dependence on sanitary measures to protect against cholera is false security.

Improper Technic

We have been using the term "improper technic" glibly, and not for the reason that we have been able to hold an error of omission or commission in any step in administration of serum and virus responsible for the break. The technic is so simple and so well understood that it is hardly conceivable that any veterinarian is incompetent or does wilfully neglect such steps as would jeopardize successful consummation insofar as administration is concerned.

How would unclean instruments or failure to sterilize the site of injection account for a break in active immunity? The worst that could happen would be infection other than cholera.

With reference to doses of serum and virus, the amount is plainly printed on the containers. If there is any criticism to offer as to dosage given, it would be in the excessive waste of serum administered. The dose per pound printed upon containers is in excess of requirements, yet we find that such doses are greatly exceeded with the thought of giving additional protection.

Immunity to be conferred is not dependent upon a fixed relation of the amount of virus to serum, the same as it applies to toxin and antitoxin. Therefore a variation from the amounts indicated would not result in a break unless the amount of serum were greatly reduced. I do not recall an instance where a serum break would suggest such a fault from the amount administered. Breaks follow vaccination when the administration is performed by veterinarians whose technic cannot be criticized from a practical standpoint.

We have histories of herds treated on the same day with the same serial number of serum and virus, by the same veterinarian, with the same technic, and yet one herd was not protected against the virus injected while the others were.

To my mind, the causes which have been considered are merely incidental to breaks and have no direct bearing upon

immunity. I do not consider them as contributory to breaks for the reason that none is concerned in immune reactions nor in regained susceptibility to virus. A given cause, to be maintained, must be operative in every break.

Avirulent Virus

Breaks in active immunity—virus breaks, as they are called—are attributed to the use of non-virulent virus in the simultaneous treatment of hogs. At this time we want to know whether or not hogs, vaccinated with virus of known virulence, break in active immunity. Of course, the inference is that if the virus was avirulent, the hogs were not actively immunized. But, what is more to the point: Do we have breaks in hogs which were known to have attained active immunity? Why is it more unreasonable to suppose that a cause will interfere with protection by vicarious antibodies, provided in a great abundance in serum breaks, than that such a cause will interfere with the protection of the hog with autogenous antibodies? The results indicate the same cause and the histories of virus breaks prove it.

The virus used in vaccinating pigs for serum tests at laboratories is all checked and found to be virulent. Some of these pigs have been known to break with hog cholera after having been turned over to the feeder.

Hogs which were vaccinated and their immunity proven by exposure to virus have broken by being subsequently turned on garbage to which the hogs were not accustomed.

Cahill[1] states: "Our belief as to the possible causes for the true 'virus breaks' is enhanced by the fact that the virus used in each case where cholera subsequently developed was shown to be fully virulent." It would seem that we have sufficient proof of the statement that pigs do break in active immunity which were known to have been vaccinated with virus of known virulence.

Impotent Serum

We need not dwell upon histories of numbers of herds, which broke in passive immunity, to prove that the serum used in these breaks was of standard potency. One history is enough for purposes of comment.

On a certain date two lots of hogs were vaccinated. There were 110 in one lot and 160 in another. These hogs were treated on the same day, by the same veterinarian, with the same serial numbers of serum and virus. The lot of 110 was protected against

the virus used; the lot of 160 sickened and deaths began on the fifth day. By the fifteenth day 140 of these pigs were dead.

These hogs were apparently well at the time of treatment. The serum used was clear and concentrated. This serial number protected the test pigs perfectly in doses of 15 cc of serum to 2 cc of virus. The average dose of serum administered to this herd was 60 cc, which was four times the amount which protected the test pigs. The hogs ranged from 70 up to 200 pounds. The same serial number protected the lot of 110 against the virus. The serum used in the lot which broke apparently afforded no protection, as the hogs sickened after the same incubation period as the virus pigs in the laboratory.

Data showing the results of the use of 43,500 cc of the same serial number in other herds indicate uniformly good results. Cahill states:

> The field results following the use of one hundred million cubic centimeters of anti-hog cholera serum and six million cubic centimeters of virus were carefully studied. This revealed the fact that the average lot of serum and virus was used in eighty-four herds. No trouble followed the use of most serial lots while one or two post-vaccination trouble cases followed the use of a small percentage. There were, therefore, from 97 to 100 per cent of satisfactory results in all cases."

Let me cite a history of a break for your consideration. Some 200 pigs were weaned, vaccinated with 25 cc serum and 2 cc virus, turned into a field of alfalfa with skim milk ad libitum. The pigs were not accustomed to the feeds and after a week a number were decidedly sick. The potency of the serum was questioned, the veterinarian recommended treatment with 50 cc of serum from another laboratory. The pigs continued to sicken when a third injection of 50 cc of serum from another laboratory was injected and new cases continued to show up. At the end of the third week over fifty pigs had died and fully that many more were sick. In less than a month these pigs, which would average less than forty pounds in weight, had received 125 cc serum from three different laboratories and none arrested the progressive infection in the herd. After investigation, the pigs were taken off pasture, the skim milk withheld and not another pig sickened. Surely antibodies to hog cholera virus were provided greatly in excess of requirements. The serum was impotent, it is true, not on account of a dearth of antibodies, that is evident, but because the antibodies in the blood which were injected remained unfixed to the susceptible cells, for the reason that the complement apparently had become fixed to the antigen-antibody complex of feed origin, and was not free to fix

the virus antibodies to the cells for their protection. This is given as a theoretical deduction but some such reaction evidently must take place to account for conditions which actually exist.

My experience goes to show that re-treatment of hogs in breaks is not effective while hogs are in reaction to feeds to which they have become sensitive. When such feeds are withheld, re-treatment is unnecessary.

Cahill offers some interesting data for speculation. May not the favorable results which he obtained in re-treating hogs in breaks, with the blood taken from hogs which were not hyper-immunized, have been due to applying the active agent for the completion of the immunizing process?

Cahill also states that in 152 herds which had been treated (serum-virus) and which sickened with what seemed to be an acute septicemia at from four to thirty days after vaccination, the blood in these pigs was found to be infective in only 19.7 per cent of the pigs. It is remarkable to note how soon virus disappears in some instances from the blood of pigs which had become sick after vaccination, in fact, sooner than it does in pigs successfully vaccinated.

Cahill may take exception to cataloging as breaks these cases which do not reveal the presence of virus in the blood. The inference, however, is that in pigs vaccinated while apparently well and which become sick after the period of cholera incubation, the serum failed to protect against virus and those organisms which are symbiotic. We have records of herds which broke, in which the blood tested for virulence, seven to nine days after vaccination, was found to be avirulent, yet reports of the bacteriological study of the tissues noted all the tissues showing a general paratyphoid infection. It occurs to me that if the biological process had been normal in the hogs during the reaction period to virus, the serum would have protected against the symbiotic invaders as well as the virus of cholera.

Three Agencies Involved

Insofar as human agencies are concerned, there are but three parties connected with the immunization of hogs against cholera. These are, the serum producer, the veterinarian, and the feeder of the hogs. The serum producer supplies the means, the veterinarian administers the means, but the feeder establishes the fact of immunity, or the reverse, according to his skill in maintaining normal physiological functions in the hog. We must

keep in mind that it is the immunizing process which takes place in the hog that determines the fate of the virus and that neither the serum producer nor the veterinarian has control over that process.

If the feeder does not understand the conditioning of the hogs for the feed they are to eat, and establishes in the cells of the hogs a sensitiveness against such feeds, such a hog can not be immunized, either passively or actively, against hog cholera.

At this time we conclude that acquired immunity to hog cholera can be brought about only by exposing the hog to the antigen (virus) in combination with its antibodies. We know too that when such a combination is effected in the hog, no amount of virus exposure, internal or parenteral, can have the slightest effect in breaking the immunity.

We have proved that, though antibodies have been injected in excess of requirements for hogs in normal metabolic activity for their protection against hog cholera virus, these antibodies fail to protect hogs against the virus in abnormal immune reactions. A hog's cells must be without protection to virus at the time of exposure to virus or there would be no infection. That is self-evident.

Immune reactions are specific, whether these reactions are concerned in protection against hog cholera virus or in protection against antigens of feed origin, which are inimical to normal biological functions. The failure to immunize is as much a biological phenomenon as successful immunization. A cause which inhibits immunity to cholera is specific and therefore not identical.

Cause of Breaks

We observe effects of agents of unknown composition and strive to link effect with cause to account for conditions which we know to exist. We know that potent serum, administered in sufficient quantities to protect, fails to protect hogs in antigen-antibody reactions to feeds. For instance, suppose we were to vaccinate a number of hogs with serum and virus of proven potency. After vaccination divide the hogs into two lots. Continue one lot on feeds to which the hogs had become accustomed, and start the second on feeds which were foreign to the hogs, such as garbage, if grain-fed hogs. Allow as much garbage to the hogs as hogs of equal weight which are accustomed to garbage will consume with impunity. In from a week to two weeks

some of the hogs on garbage will be noticed to be off feed, the eyelids edematous and weeping, the membranes pale, a discharge of stringy mucus from the nose, thumps, and a harsh cough when disturbed. Some hogs may show only skin reaction, by the hair standing erect, giving the hog the appearance of a porcupine. These are not symptoms of cholera, but cholera symptoms follow, in the hog carrying virus, in a day or two, which will be shown by the sustained temperatures, evidence of extreme prostration, which is so characteristic in cholera, and bowel disturbances. We have a break in passive immunity, while the immunizing process goes on without an indication of a reaction in the hogs on the accustomed diet, and these hogs subsequently prove indifferent to exposure to virus.

These experiments have been conducted a number of times; once, in Tennessee, on other feeds than garbage and four times on garbage. The results are dependable when the hogs react to the feeds. If the hogs do not react to the feeds, there is no break. A larger percentage of hogs will react to garbage, green corn, green milo maize, soy beans, rice polish, and casaba melons. It is interesting to observe reactions in hogs which have once become sensitive to a feed. It may be stated that once a reactor, always a reactor.

An Exemplary Case

For instance, a herd of over a hundred hogs was given all the casaba melons they would eat, without preparation for the melons. After two weeks the owner had lost several hogs and there were more sick. The symptoms were so characteristic that there was no hesitancy in making a diagnosis and I admonished the owner to discontinue feeding the melons. He called up again, in about three weeks, to advise that he had lost two more. A visit to the ranch showed that there were the same symptoms as before and the cause was evident—two wagon-loads of melons in the hog-lot, with no other feed. When the owner was again advised to stop feeding the melons he mentioned instances where melons were fed by others without causing sickness in the hogs.

You have the same contention with garbage feeders. Of course, some feed melons and others garbage to hogs without causing sickness, but they understand the conditioning of the hogs for their feed. But when once hogs react to certain feeds, they are likely to react again, although some do outgrow it. This feeder

took his hogs off melons and the hogs recovered. After two more weeks he again called up and stated that he was again losing hogs. A visit showed the same condition, with all the melons his hogs could eat. He then kept melons away from his hogs and he had no more trouble. If these hogs had been vaccinated there would have been a break, no question about that.

I have seen hogs, which had acquired a sensitiveness to milo maize, react several times in succession when the feed was resumed. I have observed this condition in pigs on garbage. They react, the feed is changed, and they recover. Place them on garbage again and you cause the same reaction. Again change the feed and they recover. I have had several lots react as many as three times. Usually the pigs die of necrotic enteritis and inanition, if the experiment is continued.

Feed Reactions Cause Breaks

Reaction to feed will also cause breaks in active immunity. Some 4000 hogs were vaccinated. These hogs were fed small amounts of barley, buttermilk, raisins and dried figs, for a month. In spite of the fact that one hog out of a bunch died with symptoms and lesions of cholera, while several more were off, the losses were very slight. The hogs made good gains and were in good condition a month later, when they were shipped to a garbage plant. The first 2200 were taken to the fattening pens, where they had access to all the garbage they could eat. They did fine for about a week, when they appeared off. The sick ones were removed to other pens. The deaths in one day amounted to sixty. Accurate count was lost, but fully fifty per cent were dead. In the next shipment 1200 were segregated and divided into eight lots of average weight. Four lots were conditioned for the garbage, four lots were fed 4 per cent of their weight per day of garbage, divided into two feeds for the first two weeks and gradually increased. During the three weeks of conditioning, we had no losses in the 600 which were conditioned, while the loss in one of the lots was over twenty-five per cent. As there were about 125 pigs in the conditioned lot which had not been castrated, they were castrated and two died from infection following the operation. These were all that died in the 600 in a month's time. The other lots continued to have losses, symptoms of feed reaction were similar to those in the hogs which broke in passive immunity. Several of the lots of the conditioned hogs were exposed to virus and proved to be immune.

The history of feed reaction is not always so obvious in every break. However, in every break which I have investigated, the feed reaction has always been evident.

The autopsies in hogs reacting to feeds show such changes as are due to increased capillary permeability: lymphatic glands edematous and enlarged, the bronchial tract containing vast quantities of mucus and serum, churned into a froth by respiration. Portions of the lungs, usually the apices, show a water-logged appearance, due to exudate of serum and fibrin ferment, which coagulates when coming in contact with the inspired air. Then a fibrosis of the lung obtains, which structure may later show abscess formation. The pleural sac may contain quantities of reddish serum; the liver and kidneys are congested and show areas of more marked congestion resembling a blush. In the early stages there is usually a large quantity of clear serum in the peritoneal cavity, which coagulates upon exposure to the air.

In pigs after weaning, when the process becomes chronic, the edematous mucosa becomes infected with bacteria which inhabit the intestines and a necrosis results. There may be edema of the lungs together with necrosis of the intestinal mucosa in the same pig, showing a common cause for the condition.

The symptoms and lesions described as those of reaction to feeds have been attributed to other causes, such as dust, lack of ventilation, deficiency in diet and exposure to cold.

Dust

An experiment in which a number of hogs were vaccinated and divided into two lots was conducted. The two lots were housed in the same shed. A partition separated the two lots. No bedding was used and the dust was deep on the floor. One lot was carefully prepared for garbage, while the other lot was placed on garbage alone, without preparation. The garbage-fed hogs, after about a week, became sick with symptoms described as characteristic of reaction to feed. After they became sick they would lie with their heads and nostrils in the dust. When chased out of their beds they would begin coughing, a harsh, persistent cough, blowing clouds of dust before them. Any one observing such a demonstration of the supposedly irritating effects of dust would conclude that the dust was the cause of the cough. The lot on the other side of the partition did not cough or show any signs of being off. They had the energy to keep their nostrils out of the dust. I have seen this condition develop in

hogs bought and turned into fields of acorns where mast was abundant. These hogs had never been housed, were farrowed in the open and reared in the open.

Exposure to Cold

In hogs which have established a sensitiveness to feeds, exposure to colds is a decided factor in augmenting visceral engorgement. Often such hogs, if shut out on cold rainy nights, will be found decidedly sick in the morning. If rains and cold weather continue, the deaths in such hogs will show a marked increase. However, hogs which tolerate their feed show no ill effects of exposure to cold and rains.

Deficiency of Diet

McGowan and Crichton[2] record some interesting experiments showing the effect of iron deficiency in pigs. They state that if the diet of the sow in pregnancy is deficient in iron the effect is noticed in pigs in about three weeks after birth. The symptoms observed are pale color, very fat and stocky, more or less listless, often blueness of the ears and along the neck and body, spasmodic breathing, diarrhea, and often pronounced and excessive thirst. The hemoglobin may be as low as 20 per cent (normal, 60 per cent to 80 per cent). Autopsy: excess of pericardial fluid, the lungs edematous, some of the pigs having effusions in the pleural cavities and peritoneum. The liver is studded with a surface of white dots indicating fatty degeneration in the center of the lobules. The blood and lesions were sterile. They state the use of ferric oxid prevented the diseased condition.

You will notice they have given a presentation of symptoms and lesions which I have designated as characteristic of feed reaction. It may be that the deficiency of iron, which may act as a catalytic agent, renders the pig more susceptible to the formation of metabolites which would interfere with immune reactions. The hypothesis, that the high velocity of oxidation of the food-stuffs in the cells is based upon catalysis on surfaces containing iron, has been confirmed by Warburg.

The experiments conducted by McGowan and Crichton have been duplicated in experiment stations in this country without confirming the results they obtained.

In my opinion the iron deficiency in the pigs was due to non-absorption from the edematous intestinal tract which was produced by reaction to the diet. Breaks have occurred with the

identical premonitory symptoms and lesions as they describe in pigs on alfalfa and rice polish or alfalfa and skim milk. The alfalfa should provide the iron necessary for proper nutrition. Further experiments are needed to determine the part that iron deficiency plays in immune reaction.

Xerophthalmia Frequently Observed

Xerophthalmia is frequently observed in suckling pigs from sows which were bought as feeders while pregnant and placed on garbage. This condition, as you know, has become classic as an indication of deficiency in vitamin A. When the disease appeared in rats given feed containing sufficient vitamin A, McCollum suspected excess of common salt in the diet. This supposition he has also discarded. McCollum, Simmons and Earnestine[3] summarize the experiments to account for the development of xerophthalmia as follows: "The results described are not to be accounted for by any existing views on the relation between dietary effects and pathological changes."

Hogs seem to be more susceptible to the stimulus of feeds than any other animal. Hogs will gain more rapidly on given quantities of feed than any other animal. Therefore a tolerance for the feeds should be established in the hog before it is flushed. This can be done in the same manner as laboratory animals are desensitized to foreign proteins. A small amount of the feed against which the hog is to be protected may be allowed each day, while maintaining a nutritive balance on the feeds to which the hogs have become accustomed. For instance, to grain-fed hogs which are vaccinated and intended for garbage feeding, give a maintenance ration of a mixture of about two parts ground corn or barley and one part of wheat middlings, made into a mash with buttermilk, or tankage, one part to about ten of the grain and middlings, and allow the pigs about one pound of the mixture per hundredweight of hog per day.

If alfalfa or clover is available a small feed per day should be given. If not, a supply of leafy vegetables from the markets. Give a small amount of garbage once a day, about one pound per hundredweight of hogs, this to be continued for a couple of weeks. At the end of the second week the grain mixture may be withheld and the garbage increased to about 3 per cent of the weight of the hogs, given in two feeds for the third week, and after the third week the garbage gradually increased. This can

also be carried out on hogs on new corn or any other feeds that are available.

Pregnant Sows Require Careful Feeding

Sows carrying pigs should also be fed with caution, as pigs acquire a sensitiveness for feeds and show reaction to the milk of the sow on such feeds. This is shown by intraperitoneal injections of anti-hog cholera serum taken from hogs which have been on garbage. When serum from such a source was injected intraperitoneally into pigs a month to six weeks old, an anaphylactic shock was produced which followed in a few minutes after injection. Asphyxiation was the symptom most marked. As a rule, if the pigs were noticed immediately and artificial respiration performed, they recovered, but some died in spite of our efforts to resuscitate them. The autopsy showed the heart in diastole and intense engorgement. When serum was used which was taken from purely grain-fed hogs, such symptoms were never manifested. Some garbage feeders condition their pigs on garbage alone by feeding the leafy vegetables for the same length of time before changing to richer garbage.

This is not good practice, as the loss of thrift in pigs on such a defective ration makes the procedure unprofitable. The younger the hog the more care is needed to get it on feed without injury. The practice of heavy filling, to offset shrink during shipment of hogs which are intended for vaccination at public stock-yards, should be discouraged. Such hogs should be fed sparingly, at least a week prior to shipment, and a very light diet of bulky feed en route. Inactivity and exposure of hogs incident to shipping makes this imperative, if dependable results are to be obtained in vaccination. The feeder shifts the burden of reproof for bad results, coming from his avarice, upon the shoulders of the serum producer and the veterinarian. We should place the blame where it belongs, so that the feeder may understand and assume responsibility for bad results. The veterinarian must realize that his responsibility does not end with blameless technic. He should leave explicit instructions as to the care and feeding of hogs, not only while carrying virus but during the entire feeding period.

I am convinced that when we better understand the fitting of hogs for the feed they eat and are able to put the understanding into practical application, breaks in the continuity of immunity to hog cholera will be a rarity and vaccination will be practiced

as a routine procedure by many owners whose confidence has been shaken by breaks in immunity. We will then have controlled hog cholera and made the industry as safe as any business venture. The process of vaccination against hog cholera has a potentiality of 100 per cent effectiveness.

Conclusion: A hog must be protected against the feed he eats to be protected against hog cholera.

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[2]McGowan & Crichton: Biochemic Jour., xvii (1923), p. 204; xviii (1924), p. 265.
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DISCUSSION

DR. C. M. HARING: It is difficult for me to distinguish between what are established facts, as described in the paper, and the mere expressions of opinion or the attempts of the writer to formulate theories, which explained to him why hogs get sick and die under conditions where the cause is not clearly apparent.

Carefully controlled experiments are necessary to prove or disprove some of the astonishing claims which Dr. Jay has made. If he would confine his statements to careful and complete descriptions of what he actually observes, and give less space to purely theoretical discussion, his ideas would be easier to comprehend.

I sincerely believe that, fifty years from now, we will recognize many important truths in this and other papers which Dr. Jay has written.

CHAIRMAN STEEL: I have jotted down a few notes myself. I am like Dr. Haring; I hesitate very much to criticize Dr. Jay's paper without conducting a very careful study of it. You can not do that by just listening to it. However, I think that we should be very careful in accepting any opinions that are contrary to those generally accepted.

In regard to the proper age for vaccination, we have found from experience that we can vaccinate hogs after they are weaned, if they are in good, thrifty condition, at from fifty to seventy pounds, and immunize them for life. In the last seven years, I think I have immunized fifty thousand pigs without a single break. Now, if this question of feed were very important in the production of breaks in active immunity, I should think that I should have run across some.

I have talked with Dr. Dorset regarding the vaccination of suckling pigs. He has conducted some experiments—I think on 800 pigs—in which he has shown that we may vaccinate suckling pigs and produce active immunity, but at the time I talked with him, the latest test they had tried on these pigs was at six months after vaccination. Field tests, or tests that meet field conditions, should be at longer intervals than that. That would meet only the conditions for marketing for slaughter. We have to vaccinate hogs that will stay in the herd two, three, and four years. In cholera outbreaks, I have often had an immune boar from a pure-bred herd, vaccinated two years or more, the only hog left on the place. One year, we lost 12,000 hogs, or twelve per cent of the hogs in Grundy County. During that time, I did not have a single break. As long as we can secure results like that, I hesitate to accept any other method until it is thoroughly tried out.

In regard to vaccinating suckling pigs, I also find, as Dr. Jay has stated, that they go through a period of parasitic infestation and exposure to certain pig-pen infections. If we vaccinate those pigs in that condition, we are going to stunt a good many of them.

In regard to castration: As a rule, I do not castrate pigs at the time of vaccination. I do not think it is good practice. I think, if we do one thing, and do that well, that is sufficient.

Regarding worms: I have been making a practice of examining every herd before it is vaccinated, if I can at all. I think probably three-fourths

of the herds that are vaccinated require treatment for worms. I find that if I go ahead and vaccinate those hogs that are filled with worms, I will stunt them. The pigs will not grow and develop. On the other hand, if I remove the worms and do a thorough job, the pigs will respond wonderfully, and in two or three weeks they are in shape for vaccination.

In regard to garbage feeding: While down at the University of California, I had some experience with that. We had trouble in securing hyperimmune hogs, so we went to several garbage-feeders and secured hogs for hyperimmunization. A good many of these hogs had never been vaccinated with a drop of serum or virus, but they withstood hyperimmunization with virus as high as six cc to the pound of body weight. I think we secured hogs from as many as a half-dozen different places.

I think that garbage can not be fed at all to ordinary hogs unless they have acquired immunity by exposure, which would take six or eight months. Birch, in his work, showed that meat scraps did not retain the virus unless kept in a state of preservation, that down in around the joints, the virus was kept active as long as a year, so it would depend upon what state of preservation this garbage was kept in, whether or not it would produce hog cholera.

As regards the dose of serum, I can not agree with Dr. Jay or with Dr. Niles. They state that it would seem the dosage of serum on the bottle is larger than necessary. If anything, I would increase it ten cc; vaccinate pigs under experimental conditions, and you may get by with the 15- or 25-cc dosage, but under field conditions, conditions which we can not control, I think the increase in dosage is very important. I think that if veterinarians will increase the dosage instead of cutting it down, they would have better results. It is my opinion that you can control such conditions as necrotic enteritis and some of these feed conditions that Dr. Jay brings up, if you increase the dosage of serum.

In the teaching of this work to farmers in Iowa, the veterinarians conducting these schools give the minimum dosage as forty cc of serum. They claim that is one of the reasons why some of these men get by as well as they do, with their own vaccination.

Now, I think the care of the virus is very important. Some veterinarians will take virus to the field, have two or three bottles left, expose it to a temperature of around 100° F., bring it back, and maybe take it out to the field four or five times. Some of that virus is destroyed in two or three days. It is very sensitive to heat.

I have made a practice of carrying virus to the country in a portable refrigerator. I have always done that since my work in the laboratory, where I found it was necessary that we maintain virus at a temperature of 35-55° F. I think that in that way we will avoid a good many of these immunity breaks.

BOY, PAGE DR. BERGMAN

An encyclopedia advertisement asks the question: "How long does the cow chew her cud?" To which a brilliant columnist made the following wise crack: "Great is our love of dumb creatures and keen is our interest in animal life, but doggoned if we'll ever consent to hold a stop watch on a cow."

FOOT-AND-MOUTH DISEASE IN GREAT BRITAIN

Restrictions imposed by the Ministry of Agriculture in connection with foot-and-mouth disease in the counties of Warwick, Cheshire and Northampton were recently withdrawn. There are now no restrictions in force in Great Britain for the first time since the widespread outbreak in 1923.

TEAT LESIONS IN COWS REACTING TO THE TUBERCULIN TEST*

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For several years, in the course of the diagnostic work of this laboratory, we have observed peculiar lesions in the teats of certain cows reacting to the tuberculin test. These lesions were brought to our attention particularly because, in a large percentage of the cases, no other lesions were found, and in some cases the teats were obtained from cows which were the only reactors in herds having no history of tuberculosis.

In view of the recent discussions of "no-lesion" reactors, and the studies of skin lesions in otherwise no-lesion cases, it should be of interest, and possibly of some value in the solution of these problems, to present some data on sixty of these teat-lesion cases which have been studied in this laboratory. We are not reporting a complete experimental study, as this laboratory is not primarily a research laboratory. Our observations have been made on material forwarded to the laboratory by our field veterinarians, in most cases without complete histories, and the laboratory work has been such as could be carried out in connection with our routine work, and without time and facilities for extensive experiments.

The lesions under discussion were all of one type, and varied in some respects from tuberculous lesions found in other organs. The variation in gross appearance was sufficient to cause the veterinarians making the postmortem examinations to doubt whether the lesions were tuberculous. This doubt was increased by the fact that in some cases the tuberculin reaction had been slight or atypical. It is probable that many such nodules on the teats have escaped recognition, as their external appearance in most cases would not suggest tuberculosis.

The lesions consist of one or more hard nodules, varying from 1 cm. to 5 cm. in diameter, situated just beneath the skin of the teat, usually in the proximal half. The lesion involves the skin, showing either an open sore, with a raw surface or scab, or scar

*Presented at the sixty-second annual meeting of the American Veterinary Medical Association, Portland, Oregon, July 21-24, 1925.

tissue marking the healed ulcer. The milk duct was not involved in any of our cases, not did the udder show any lesions of tuberculosis. The nodules consist of fibrous connective tissue, in which are imbedded small pus foci, varying in size from points up to about 2 cm. in diameter. These foci contain a smooth, yellow pus. In a few cases there were no definite abscesses, but strands of yellow tissue ran in an irregular manner through the connective tissue matrix. In several instances there was nothing apparent to the naked eye except a slight subcutaneous proliferation of fibrous connective tissue, which was slightly hemorrhagic.

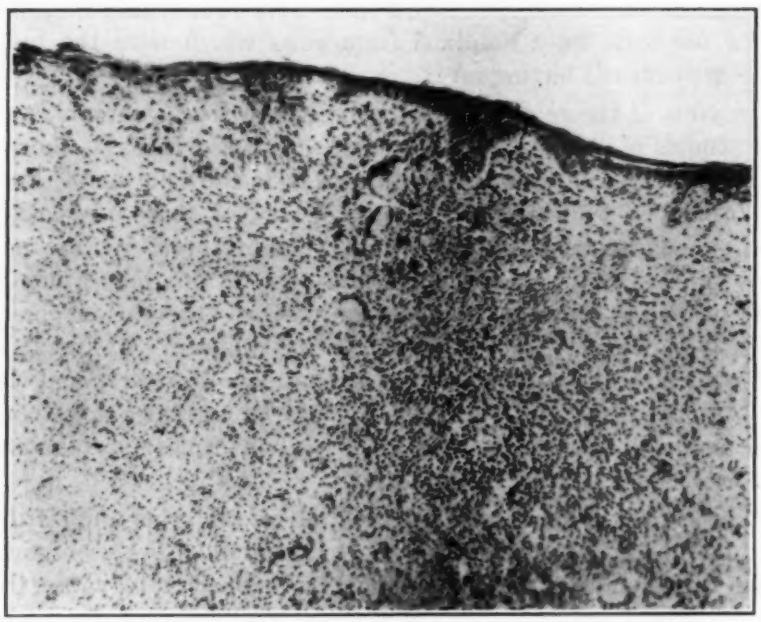

FIG. 1. Section of specimen 1247, showing infiltration of lymphocytes and giant cells. x 100.

Microscopic examination of these lesions, however, showed tubercle formation. None of the lesions showed any caseation, and there was no gross calcification, although sections showed some calcareous deposits.

Smears were made from the cut surfaces of all the lesions, and stained with Ziehl's carbol-fuchsin. In forty-five of the sixty cases, acid-fast bacilli were demonstrated, usually in very small numbers. In five of the fifteen cases which were negative on smears, the characteristic histopathology of tuberculosis was found in sections and, in one of these cases, acid-fast bacilli

were demonstrated in the sections. In only five of the cases did we note that acid-fast bacilli were present in considerable numbers.

The morphology of the acid-fast bacilli found in the smears was variable, but there was a type that seemed to be characteristic of all these lesions. The bacilli were very small, and were shorter and thicker than typical tubercle bacilli from other sources. The organism occurred very frequently in pairs, of rather short individuals with rounded ends. In three cases we noted longer forms, some of them showing beaded staining.

FIG. 2. Section of specimen 1246, showing tubercles and giant cells. x 100.

We have noticed that the acid-fast bacilli occurring in some skin lesions from other parts of the body showed the same short, thick and evenly-stained form.

Sections for microscopic study were made in sixteen cases. In all but one of these cases the sections showed the characteristic histopathology of tuberculosis. The one instance in which we did not find evidence of tubercle formation was from a specimen from which positive smears were obtained. In most cases definite tubercle formation was seen in sections. In three instances we did not find definite tubercles, but there was infiltration of lymph-

ocytes in irregular formation in the connective tissue matrix, with many giant cells scattered through the tissue. Figure 1 shows this condition in a portion of a section of specimen 1247. This section shows the inflammatory reaction just beneath the skin. Figure 2 shows two young tubercles in a section of specimen 1246, one of them showing a large giant cell at the center. Figure 3 is a more highly magnified photograph of the center of the tubercle containing the giant cell.

Laboratory animals were inoculated with material from thirty-six of the cases. Sixty-five guinea pigs, fourteen rabbits, seven

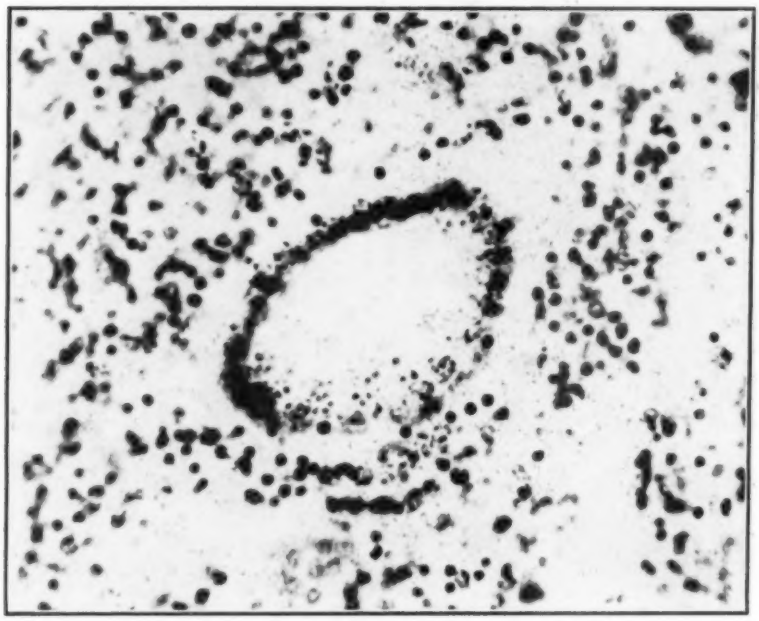

FIG. 3. One of tubercles show in fig 2. x 500.

chickens and two hogs were used. The test animals were carried from sixty to one-hundred and fifty days after inoculation, when they were killed and carefully examined postmortem. None of the animals developed lesions which could be recognized as tuberculous, but in three guinea pigs, inoculated with material from three different cases, there was evidence that the acid-fast bacillus did establish itself to a slight extent. In the case of specimen 355, of two guinea pigs inoculated, one was entirely free from visible lesions on postmortem, but the other showed two pin-head white spots on the liver, in which acid-fast bacilli

were demonstrated. Two guinea pigs were inoculated with material from specimen 724. Postmortem examination of one of these pigs showed a pin-head spot on the lung, in which acid-fast bacilli were demonstrated. From specimen 1120 two guinea pigs were inoculated, one subcutaneously, and the other intra-abdominally. The pig inoculated under the skin died in thirty days from other causes. The pig inoculated intra-abdominally was killed in sixty days, and postmortem examination showed a small nodule in the spleen, not resembling a tuberculous lesion. Smears from the spleen showed many acid-fast bacilli. A rabbit and a guinea pig were inoculated with material from the spleen, to determine whether the infection could be transmitted to another animal. Both were killed in sixty days. The rabbit showed no lesions. The guinea pig showed slight enlargement of the spleen, and a few minute white spots beneath the capsule of the liver. Smears from both liver and spleen were negative.

In interpreting the results of the inoculation tests, the fact should be taken into consideration that in a large majority of the cases the number of acid-fast bacteria present in the inoculum was small, as shown by the smears, and that the presence of a larger number would increase the probability of the organism establishing itself in the body of the inoculated animal.

Cultures were attempted in only six cases, and in no case were we able to cultivate any acid-fast organisms. Most of the material was unsatisfactory for culture work, and as we were unable to produce lesions in experiment animals, we could not obtain proper material for culture purposes.

Table I shows the data on each specimen in abbreviated form.

Discussion

The point in connection with data of this nature, which is of interest to sanitary officials engaged in the control of bovine tuberculosis, is their bearing upon the diagnosis of tuberculosis in cattle. In this connection, the interpretation of our observations is rather difficult. If it were possible to have obtained complete histories of all these cases, the problem might have been somewhat simplified. But as the data under discussion were obtained in the course of routine, tuberculosis-eradication work, it was not possible to obtain all the information necessary to draw definite conclusions.

I believe that the teat lesions described in this paper are of the same nature as the skin lesions referred to by various workers.

TABLE I—*Tabulation of data on teat lesions*

No.	History	Other Lesions	Skin Surface	Smears	Sections	Cultures	Animal Inoculations	
							Guinea Pigs	Rabbits
77	Reactor	None	Open sore	+				
276	Reacted to intradermal. Failed to react to ophthalmic. Tuberculous bull in herd one year previously	None	Open sore	+				Negative
296	Reactor. Herd never tested before. No other reactors in herd	None	Not open on surface	+				
353	Reacted on final accredited-herd test	None	Open sore	—	Tubercles, with giant cells		Negative (2)	
354	Reacted on final accredited-herd test	None	Not open on surface	+			Negative (2)	
355	Reacted on final accredited-herd test	None	Not open on surface	+			One negative; one, pin-head nodules in liver; acid-fast bacilli	
366	Reactor	None		—	Tubercles		Negative (2)	
396	Only reactor in herd	None	Open sore	—	Infiltration; lymphocytes, with giant cells. Acid-fast bacilli		Negative (1)	
425	Only reactor in herd	None	Open sore	+				

426	Only reactor in herd	Pleura (?)		+				
435	Reactor. No other reactors in herd. Herd never tested before. This one bought about one year previously	None	Open sore	+ Many				
438	Reactor. Two tests had shown abrasions for six months. No other reactors. Herd not tested for ten years previously	None	Open sore	+ Many	Acid-fast bacilli in large numbers. Many beaded forms			
439	Reactor. Had sore teat for past six months. This cow came from infected herd one year previously	None	Open sore	+	Tubercles, with giant cells			
462	Only reactor in herd	Udder and liver		+				
466	Only reactor in herd	Liver	Scar	+			Negative (2)	
467	Only reactor in herd	Cervical gland	Not open on surface	—			Negative (2)	
469	Reactor. Two other reactors in herd, both showing teat lesions; also other lesions	None	Scar	+			Negative (2)	
470	Reactor. From same herd as 469	Liver	Scar	—			Negative (2)	
472	Reactor. From same herd as 469	Cervical gland	Open sore	+			Negative (2)	
475	Only reactor in herd	Body glands	Open sore	Beaded forms present			Negative (2)	Negative
476	Only reactor in herd	None	Scar	+			Negative (2)	Negative
477	Only reactor in herd. Brought from Minnesota three years before	None	Scar	+				

TABLE I—*Tabulation of data on teat lesions (Continued)*

No.	History	Other Lesions	Skin Surface	Smears	Sections	Cultures	Animal Inoculations	
							Guinea Pigs	Rabbits
478	Only reactor in herd	None	Scar	+			Negative (2)	Negative
479	Reactor. One other reactor showing lesions in glands	None	Scar	+			Negative (2)	Negative
485	Reactor		Open sore	+				
486	Reactor		Open sore	+				
494	Only reactor in herd	Skin lesions similar to teat lesions. Smear from skin lesion positive. Lesion in mediastinal gland	Open sore	—				
495	Only reactor in herd. Cattle had been bought from reactor herd	None	Open sore	+ Rather long and beaded				
542	Reactor. Three reacted in herd. One showed body-gland lesions. One showed teat lesions only	Skin		+				
543	Reactor. Two reacted in herd. Other one showed teat lesions only	Skin		+				

544	Reactor. Two reacted in herd. Other one was calf showing generalized tuberculosis	None		+				
545	Reactor	None		+				
555	Reactor. Six other reactors in herd, showing other lesions	Cervical and mediastinal	Scar	+				
561	Reactor; three teats	None		+ Many				
579	Reactor	None		+				
611	Only reactor. Intradermal suspicious, ophthalmic slight. From accredited herd. No reactors found in previous tests	None Supramammary enlarged	Scar	—	Tubercles, with giant cells	—[1]		
628	Reactor	Body glands	Open sore	+	Infiltration of lymphocytes with giant cells			
641	Only reactor in herd	None		+				Negative (2)
663	Reactor. Nodules on teat showed only proliferation of fibrous tissue	Supramammary		—				
724	Only reactor in herd. Same herd from which 494 was obtained six months before	None	Open sore	+ Many			One negative; one, pin-head spot on lung in which acid-fast bacilli were found	

[1]For acid-fast bacteria.

TABLE I—*Tabulation of data on teat lesions (Concluded)*

No.	History	Other Lesions	Skin Surface	Smears	Sections	Cultures	Animal Inoculations	
							Guinea Pigs	Rabbits
754	Only reactor in herd	None	Scar	+ Many	Tubercles with giant cells		Negative (2)	
821	Only reactor in herd. This cow came from reactor herd	Lymph glands	No surface lesions	—			Negative (1)	
831	Reactor	None	Open sore	—				
831a	Reactor	None	Open sore	—			Negative (2)	
1090	Reactor	None	Open sore	—			Negative (2)	
1120	Reactor. Six other reactors, with various lesions	None	Open sore	+		—	One negative; one, slight elevation on spleen. Smear from spleen showed many acid-fast bacilli	
1211	Only reactor in herd	Cervical and mediastinal glands	No surface lesion	+	Tubercles, with giant cells	—	Negative (2)[2]	Negative
1246	Reactor. No other reactors in herd. Reaction typical	None		—	Tubercles, with giant cells	—	Negative (2)[4]	Negative (2)

1247	Only reactor in herd. Two teats	None	Surfaces broken	+	No definite tubercles. Infiltration of lymphocytes, few giant cells, acid-fast bacilli		Negative (2)	Negative (2)
1299	Reactor	Body glands	Open sore	+		—	Negative (2)[3]	Negative
1300	Reactor	Body glands	Surface broken	+			Negative (2)[3]	Negative
1345	Reactor	Cervical glands	Scar	+ Some long and beaded	Showed histology not like tuberculosis	—	Negative (3)[4]	
1406	Reactor		Open sore	+			Negative (2)[3]	
1428	Only reactor in herd. Sore noticed on teat for three months	Liver	Open sore	+	Tubercles, with giant cells		Negative (2)	
1448	Reactor	None	Scar	+	Tubercles, with giant cells		Negative (2)	
1449	Reactor		Open sore	—			Negative (2)	
1450	Reactor		Open sore	+	Tubercles; no giant cells		Negative (2)	
1452	Reactor		Scar	+	Tubercles, with giant cells		Negative (2)	
1453	Reactor		Open sore	+	Tubercles, with giant cells			
1522	Reactor. Only reactor in herd. Two teats. Reactor had been taken out on previous test	None	Open sore	+				

[2]Two hogs also inoculated, with negative results.
[3]A chicken also inoculated, with negative results.
[4]Two chickens also inoculated, with negative results.

I have seen no particular mention of such lesions in teats, except in the report of Day[4] on his findings in the Star Valley cattle. Our laboratory has had very few skin lesions, other than teat lesions, sent in for examination, but from comparison of the teat lesions with the skin lesions which we have examined, and with the description of skin lesions given by various workers, it appears that our teat lesions should be placed in the same class with the skin lesions.

We have had a large proportionate number of teat lesions for study, due to the fact that our field veterinarians have been instructed to look for these lesions especially, and to forward them to the laboratory.

A year ago, I was inclined to the opinion that these teat lesions were not true tuberculosis, but were caused by an acid-fast organism giving a group reaction to tuberculin. Further study, however, has convinced me that we should go slowly in adopting the group-reaction idea, although in many cases it is hard to explain the source of infection, if we consider this condition a true tuberculosis. Some authors have classified certain skin lesions as definitely non-tuberculous because they failed to produce tuberculosis in experiment animals by the inoculation of material from these lesions. If the accepted ideas in regard to human tuberculosis are correct, a similar condition exists in the case of human lupus. Calmette[2] states that while it is possible to produce tuberculous lesions in guinea pigs, by the inoculation of material from lupus tissue, the lesions so produced are local and progress very slowly. He also states that "no one has ever been able to inoculate lupus from one human being to another." The fact of the attenuation of the tubercle bacillus, as well as other organisms, when localized in the skin tissues, has also been recently noted in this connection, by Carpenter and Goldberg.[3]

The question arose as to whether lesions similar to those which we have studied might not be found in many non-reacting cows. We thought this possible for several reasons, particularly in view of the fact that in a number of instances the teat lesions were found in reactors where only the one animal in the herd reacted, and where there was no previous history of tuberculosis in the herd. Also a number of the reactions were atypical. It was our intention to obtain such lesions, if they exist, from a number of non-reacting cows, and compare them with lesions from reactors. However, we have not yet had opportunity to

make a search for such lesions among a large number of non-reacting cattle, although, in several clean herds examined, we have not been able to find any teat nodules. We did remove one such nodule from a non-reacting cow in a herd from which we had two years before taken a cow on an atypical reaction, which showed no lesions other than the characteristic teat lesions. We were unable to determine whether the nodule from the non-reacting cow was of the same nature as that from the reacting cow. The lesion consisted of a fibrous tumor, in the center of which was a hard mass of calcareous material. Smears from the tissue were negative. The tissue was decalcified and sectioned, but no definite structure could be found which would determine the nature of the lesion.

Therefore, at the present time, we have no accurate information as to the existence of teat lesions showing acid-fast bacteria in non-reacting cows. All of our cases have been from reacting cows. They show acid-fast bacteria in smears. They show the characteristic histopathology of tuberculosis. They have not produced tuberculosis in any inoculated animal, although in three cases the acid-fast bacilli established themselves to a slight extent in guinea pigs. These facts, in view of the accepted facts in regard to skin tuberculosis in man, would apparently justify the conclusion that these teat lesions are true tuberculosis, modified by its localization in subcutaneous tissue.

If this is the case, it is somewhat difficult to explain the source of infection in many of our cases. Although our histories are incomplete in most cases, we find that some of these cases came from accredited herds, three from a herd on the final test for accreditation, and a number from herds in which no other cattle reacted and which had no previous history of tuberculosis. Under these circumstances it is difficult to understand what the source of the infectious material could have been.

As we had no history showing the probability of the presence of the bovine type of tuberculosis in these cases, we took into consideration the possibility of these lesions being due to infection with the avian disease. Therefore, in our inoculation tests we used rabbits, chickens, and hogs, in addition to guinea pigs, but we have never produced any lesions in these animals. These negative results, however, do not prove that the infection is not due to the avian type of the tubercle bacillus, as our tests with guinea pigs were also negative.

The nature of the teat lesions seems to indicate that the original infection in these cases is in the teat, rather than that the infection is carried to this point from some other focus in the body. This is evidenced by the fact that in most of the cases no lesions were found at any other point. Furthermore, we find in nearly all cases that the surface of the skin is involved, either showing a raw surface covered by a scab, or scar tissue indicating that there has been a surface sore at some time. In none of our cases has the milk duct been involved. From these facts it seems reasonable to assume that the infection has been through an abrasion in the skin of the teat. The teat is subject to abrasions from various causes, and in milk cows the udder and teats are so prominent that the possibilities of picking up infection are great whenever the cow lies down in a stable, or on the ground, where infectious material may exist. In many cases, our history does not account for the presence of this infectious material. In others, the cows have come from herds from which reactors have been taken in previous tests, and in such instances imperfect cleaning and disinfection might account for infectious material being in places which might come into contact with the cows' teats. If it could be shown that the teat lesions described here were due to infection with the avian organism, the presence of tuberculous poultry on the premises would account for the source.

In this connection, it might be mentioned that difficulty in establishing the source of infection in tuberculosis is not confined to this particular class of cases, nor are negative results in inoculation tests unknown in typical cases of tuberculosis.

Summary

This paper reports data on sixty cases of teat lesions in cows reacting to the tuberculin test.

The lesions differ somewhat, in macroscopic appearance, from typical lesions of bovine tuberculosis as found in other organs.

Microscopic examination of sections from sixteen of the cases showed the characteristic histopathology of tuberculosis. The other forty-four specimens were not sectioned.

Acid-fast bacilli were demonstrated in smears from forty-five of the cases. In most instances the bacteria were found in very small numbers, and the morphology of the bacilli showed a type that was shorter and relatively thicker than the usual form.

Laboratory animals were inoculated with material from thirty-six of the cases. The results were completely negative in all but

three cases. In these three cases no recognizable tuberculosis developed, but, in one guinea pig in each case, acid-fast organisms were demonstrated in minute, white nodules on the liver in one instance, in the lungs in the second, and the spleen in the third.

Cultures were attempted in six cases, but we were unable to cultivate any acid-fast organism.

It is our opinion that these teat lesions are primary lesions due to infection through abrasions on the teat; that they are of the same nature as the skin lesions described by several authors; and that they are caused by the *Mycobacterium tuberculosis*, modified to some extent by its habitat in the subcutaneous tissue, rather than by another acid-fast organism giving a group reaction with tuberculin.

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DISCUSSION

DR. S. O'TOOLE: To me that was a very interesting paper, but I do not know how you feel about it or how it may appeal to the rest of you. I have had some slight experience in work of that kind and I think it was a very timely paper, for the reason that we are going to experience some difficulty, some time in the future, if we are not successful in deciding on what we are trying to do. Among veterinarians we are finding differences of opinion, because the laboratory worker, dealing with conditions of this kind, is, at times, put in an embarrassing position. When a veterinarian finds lesions in the skin, and they are characteristic of tuberculosis, he thinks the laboratory worker should demonstrate the presence of tubercle bacilli. Some of these lesions in the skin which in appearance are characteristic of tuberculosis, are old and similar to the calcareous lesions found in other tissues. The laboratory man finds an old infection and it is so old that the organisms are attenuated, perhaps dead.

I am not stating this with the knowledge that it is frequently the case, but I am trying to explain the conditions found which lead one to this conclusion —I do not know whether anybody else has experienced similar difficulties with these lesions. When the lesion is small and the organism is not very active, you get but very little reactive material thrown into the system when you introduce tuberculin and your reaction is slight. What would you think of the findings in such a case, Dr. Marsh?

DR. MARSH: I do not know. It might be because the organisms seem to be attenuated in these localities. I do not know whether it is true or not.

DR. O'TOOLE: It seems to me this will be a problem for the laboratory men, because the field man, not familiar with the difficulties confronting the laboratory worker, will put some of us in a position which will lead him to think that we can not give him the service that he ought to have. Is that right?

DR. N. F. WILLIAMS: Despite the fact that the field man finds lesions, he can not get the characteristic supporting reaction.

DR. G. D. BISHOF: I have been carrying on a great deal of experimental work on so-called suspects, and I have come to the conclusion that the skin-lesion cases always give a very slight reaction unless it is broken down and becomes more in an acute stage. Going back and making a 60- or 90-day retest of the suspects, many times, they come through clean.

I have taken it up with the stock-owners, where there were knots on the skin, and opened them up and found a tuberculosis reaction in the nodules and we did away with the animal on the second test; because we thought it was a tuberculosis lesion. I would be glad to know what has been the experience with the other men along that line.

DR. W. H. LYTLE: Unfortunately, I did not hear all of Dr. Marsh's paper and I was anxious to know whether Dr. Marsh had conducted any experiments, wherein the primary lesion had been removed before the animal was tested, and then the animal allowed to remain a certain length of time before the test was given.

DR. MARSH: No; we did not have the opportunity to do that.

DR. W. H. LYTLE: I know, frequently, in accredited herds, the skin lesion will appear, and it seems to me that it might be well for the owner, if we did notice such a lesion, to attempt surgical removal first, and then wait a certain length of time and have the animal tested, and if it was negative, there would be no discrimination against the herd, and the herd would not lose its accredited position.

DR. F. A. BARBER: I have had considerable experience with skin lesions. In answer to Dr. Lytle's question, I have found skin lesions on cows and held them as suspects, and the lesions were removed and the cows tested afterwards and passed a perfect test on the 60- and 90-day retests and again at the end of six months or a year. I believe if the lesion is removed in its entirety, the animal will pass a perfect test. I believe that most all these small lesions are merely skin lesions—a great many of them, anyway.

DR. WILLIAMS: I would like to ask if the extent of the infection is indicated by the degree of the reaction—if there is any constant relationship between them. Not, as applied to this particular dead lesion, but in the general run of testing. I got that impression from something Dr. O'Toole said.

DR. O'TOOLE: If I left that impression, I did not want to, because we have not, in our postmortem work. We have had occasion to perform many postmortems on reactors and, so far as I am concerned—and those who have collaborated with me—we are not able to determine, in any way, the extent of the lesion.

We find the most violent reactions in very slightly infected animals, and in other times, from a slight infection, we find a slight reaction. It is not an index to the extent of the infection.

DR. WILLIAMS: We had a theory that such a relation existed, but we disproved it.

DR. MARSH: I agree on that. We have been collecting teats in the laboratory for several years, and one reason I worked this up was because there have been one or two publications come out advocating the theory that these skin lesions are caused by an acid-fast organism which is not the tubercle bacillus, but produces a group reaction with tuberculin. I think you ought to go pretty slow in adopting that idea. I do not think these particular lesions are dangerous. It is hard to reproduce a disease from these lesions by inoculation, but from the standpoint of sanitary science we should have more knowledge of these things before we state that these lesions are not true tuberculosis. Later on, further investigation may prove something different, but I think that in the present state of our knowledge, we should take the attitude that it is tuberculosis. Otherwise, you are going to interfere with the work of testing—if you get such results as they have in some states—if you take the position these organisms are not tubercle bacilli.

DR. WILLIAMS: Dr. Marsh is to be complimented on his activities. It is opening up a new field which increases the value of tuberculin testing. I think his plan of convicting the tubercle bacillus on circumstantial evidence is well grounded.

WATERED STOCK

When a Baltimore woman paid customs duty to the tune of $1400 on her $10,000 Chow dog, it was characterized as gross overcapitalization by one of the local papers.

TUBERCULIN TESTING ON THE WESTERN RANGE*

By S. O'TOOLE,

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In an endeavor to discuss tuberculin testing on the California range lucidly, it is deemed appropriate first to give some consideration to the laws enacted relating to this activity. The early legislation directed against the spread of tuberculosis in California was the enactment of the California Pure Milk Law, in 1915, the tuberculin-testing provision of which did not become effective until the following year. This law prohibits the sale of milk from cattle, including family cows, which have not passed a tuberculin test, unless the product is pasteurized under official supervision. The law was framed solely as a public health measure, to ensure to consumers a wholesome supply of raw dairy products. That its operation would prove effective toward the eradication of tuberculosis in cattle was not the expectation of its proponents.

Under the provisions of this act it is mandatory for dairymen to make application to the Department of Agriculture for a tuberculin test of their animals before engaging in the sale of raw dairy products. Failure to make such application, retention of reactors on the dairy premises, or the sale of unpasteurized dairy products from untested cows or reactors constitutes a misdemeanor. When new applications are received, or when cattle are added to tested herds, between regular visits of official veterinarians, the tests on such occasions may be applied by approved practitioners. For the purpose of identification, veterinarians of the Department tattoo the letter "T" in the right ear of reactors. Dairymen who sell raw dairy products are in full accord with the provisions of this law. They realize that it is to their advantage to have their herds tested and the reactors removed.

Since this portion of the California Pure Milk Law became effective, up until July 1, 1925, 645,569 cattle have been tested. The increased number of dairymen engaged in the sale of raw dairy products since the law became effective requires the Depart-

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ment of Agriculture to test approximately 120,000 cattle annually. The success achieved through the application of this provision was in a measure responsible for the enactment of the accredited herd and tuberculosis-free-area laws during the legislative session of 1921. Since these laws became effective most promising headway has been made against the ravages of the disease. The accredited herd plan, though somewhat limited in its application, has operated most effectively in a number of well-bred herds throughout the State. While the progress made in the operation of this law has been quite encouraging, nevertheless we hold that the area plan of eradication may be more advantageously applied to western conditions. By the terms of our free-area law, any county having not more than ten per cent of its animals infected, as shown by the records of the California Department of Agriculture, may obtain the cooperative assistance of the state and federal departments of agriculture in eradicating the malady. This service, however, is not extended to any eligible counties unless requested through the county supervisors or commissioners.

Testing Becomes Compulsory

When a county has been proclaimed an eradication area by the California Department of Agriculture, the tuberculin testing of all cattle in the county becomes compulsory. Reactors are branded on the left jaw with the letter "T" and disposed of under official supervision. To date all tuberculous animals found in eradication areas have been slaughtered.

Since the inauguration of the free-area plan, two counties have been declared modified accredited areas. One other county is now an eradication area, but progress therein has been slow on account of the heavy demand for veterinary service in stamping out foot-and-mouth disease, which occurred early last year. Several other eligible counties are considering the benefits of this law, but requests therefrom for its application have been delayed because of anticipated tuberculosis legislation during the recent session of the state legislature. However, conditions now appear favorable for undertaking the work in these areas in the near future.

When the enactment of our free-area law was under consideration, the subject of indemnity was given careful thought. The conclusion was reached that under prevailing conditions at that time such a provision would not be practicable. In spite

of this, cattlemen of the State, recognizing the benefits accruing from tuberculosis eradication, urged the passage of the bill without the inclusion of an indemnity clause. The exclusion of this indemnity provision elicited from some live stock sanitary officials the opinion that the successful operation of the law would be considered an heroic procedure. The undertaking, however, was not attended with the serious difficulties predicted, because all the cattlemen in the areas in which the work was undertaken are sincerely interested in the eradication of tuberculosis. The proof of their sincerity was their willingness to sacrifice reactors without reimbursement. It might be added here that such an attitude is deserving of the highest commendation, since it made it possible for the state and federal officials to carry on their work without depending on intermittent legislative appropriations. In all probability this would not have been the case had an indemnity clause been included in the bill, because if sufficient funds were at any time unavailable for indemnification, the situation might have a tendency to influence unfavorably the cooperative spirit of the cattlemen.

Work Started in Two Counties

The pioneer work under the free-area law was done in two adjoining counties, Modoc and Lassen, located in the range district. They have a combined area of 8354 square miles, which is 81 square miles more than the total of the areas of Delaware, Rhode Island and Connecticut. At the beginning of the undertaking it was extremely difficult to determine upon a definite plan of action.

Because of the large areas reserved as summer range for cattle from the valley sections, most of the herds permanently located in the counties were widely separated and, in many instances, modern transportation could not be utilized in reaching them. After a careful study of the temporary and permanent ranges, it became necessary to familiarize the cattlemen with the methods employed in applying the test. Also, through collaboration with them, practicable plans were devised for assembling and holding their cattle until the test could be completed and the reactors branded where they were found. Testing schedules were so prepared in the different localities as to ensure a maximum amount of service from riders engaged in the various roundups.

As a rule progress was slow at the beginning of a testing campaign inaugurated in a community until all engaged in the work

became familiar with the plan of procedure. After this was thoroughly understood it was possible for one veterinarian to inject as many as sixteen to eighteen hundred animals in a day.

In some instances corrals or substantially fenced areas were available, but the lack of feed and water necessitated the employment of riders to assemble and hold the herds on the open range. The intradermic test made it possible to undertake the work under these conditions, but rounding up the animals for injection and holding them for observation was at times a rather difficult task for the cattlemen. Holding-pens and chutes were provided whenever possible. Some of the cattle in isolated districts were so wild it was necessary to resort to roping. Another unpleasant feature in connection with the work was the refusal of a few cattlemen of more or less prominence to having their animals tested. However, the state authorities proceeded to make arrangements to assemble the animals and apply the test, and these objectors reconsidered their decision when informed that any expense incurred by the State through this procedure would become a lien on the cattle handled, as authorized by statute.

Cattle Entering County Tested

The provision in the free-area law requiring the testing of all cattle entering these counties materially augmented the work of the veterinarians engaged on the project. On account of the large ingress of cattle, particularly during the dry season, constant vigilance was required on the county borders to prevent the entrance of any untested cattle.

As had been anticipated, unforseen difficulties arose in different localities which sometimes slowed up the work considerably. These situations were met with patience and reason, which usually accomplished the desired results. Much useful knowledge has been gained through the application of the free-area law in these counties. The success achieved, however, should not be construed to mean that similar methods would be equally effective in range districts, where less favorable conditions prevail. Until marked progress has been made in other sections it is felt that it would be, in a measure, presumptuous to state that the methods heretofore applied would lead to an equally successful termination.

Discussion

Dr. C. G. Lamb: What provision has the State made for undertaking the policing of the borders of the counties, or is it entirely up to the cattle owners of the counties to do their own policing?

DR. O'TOOLE: We entered into that work because it appeared that the request came from the people of those counties, and we knew that all of the cattlemen in the areas, and citizens of the counties, desired to have the work carried on there. Since the request came through the supervisors, we knew that we had the assistance of all the regulatory officials in the counties. Then, we had our own state officers working in cooperation with the federal veterinarians, and we found we were supplied with sufficient authority to police properly the counties.

DR. HADLEIGH MARSH: I would like to ask at what time of the year this testing was done—that is, whether it was in the summer, on the range, or in winter quarters.

DR. O'TOOLE: Those counties are located in a section of the state where we could conveniently conduct the work only during a part of the year; because of considerable snow in the mountain districts.

DR. MARSH: Do they feed their cattle in the wintertime there?

DR. O'TOOLE: Some of the cattle are on the range permanently, and some of them are in the valley a part of the time and come from there into the summer ranges.

DR. MARSH: Do you test them on the summer range?

DR. O'TOOLE: When the work was undertaken, our law required that any cattle entering the territory must be tuberculin tested. Only those permanently located there were tested under the regular program laid out. Any others coming in were tested prior to entrance.

DR. MARSH: Does that include the mountain ranges where they were run in the summertime?

DR. O'TOOLE: We have cattle permanently located in there and we have ranges utilized only in the summertime for the cattle coming from the valley.

DR. MARSH: Did these counties constitute the territory or range into which the cattle come in summer periods?

DR. O'TOOLE: Yes sir, that is it.

DR. F. A. BARBER: What method was used in injecting the cattle, and what was the method of restraining them?

DR. O'TOOLE: We relied upon the intradermic test, and the method used in restraining the cattle depended upon the conditions. If the animals could be handled in chutes, it was done that way, and I might say that in most of the cases it was found that it could be done that way.

Occasionally, of course, we found cattle rather wild, and, in order to complete the work upon any herd in which wild cattle were found, it was necessary to rope some of them. In various communities conditions varied a great deal, and we would be guided by such conditions in determining the appropriate methods to pursue.

DR. BARBER: When you had them in the chutes, were they loose or were they restrained?

DR. O'TOOLE: Any kind of a restraining method that we had available was applied, in order that the cattle could be tested. If we had the end of the chute closed, we naturally restrained them in that way. Of course, if it were properly done, we had the heads and tails of the cattle turned in the proper direction. We could not do the work unless they were in there in an orderly manner.

DR. W. A. SULLIVAN: In conducting a test of all the cattle in a county, were all of the cattle tagged?

DR. O'TOOLE: Yes; we tagged all cattle that were tested.

DR. SULLIVAN: How long ago did you begin making the tests?

DR. O'TOOLE: We began in 1922.

DR. SULLIVAN: Have you made a check on those cattle to see what percentage of the tags remained on the cattle after the test?

DR. O'TOOLE: We have gone over those cattle and have checked them, but I do not know whether we have a complete check on them.

DR. SULLIVAN: I want to find some kind of a tag what will remain permanently in the ears of range cattle.

DR. O'TOOLE: We are trying to do the same thing also. It is rather difficult. (Laughter)

DR. A. W. FRENCH: We never put a tag on the cattle we test for the reason that we can not find a tag that will remain on range cattle over a week. We tried every tag made, and we found that if the cattle go into the willows and brush, the tags come off almost immediately. We never found a tag that would remain fixed on any range cattle and, for that matter, on a great many of the dairy cattle. The tattoo system is the only system we have found that would work out.

DR. O'TOOLE: Yes, that is a problem for various owners to consider. We should have a solution to the problem, but you will find there is some objection to branding animals, and it is difficult, at times, to get people to agree to having it done.

We felt that we had gone a considerable distance when we got the cattlemen to agree to have their cattle tested without demanding an indemnity. We got a tag that was as good as we could find at the time. It is far from perfect, although, if there is any tag that is perfect, or nearly so, we would be glad to adopt it.

DR. FRENCH: We have found some of the cattlemen who made no objection to our catching and testing their cattle, but they would not let us tag them or brand them.

DR. O'TOOLE: We did not experience any difficulty concerning the tagging of cattle, probably because it did not cost the cattle-owners anything.

DR. FRENCH: Did the veterinarians put those tags on themselves?

DR. O'TOOLE: Yes; the veterinarians put the tags on.

DR. SULLIVAN: In attempting to tag wild range cattle in testing-chutes, in Idaho, a number of the veterinarians narrowly escaped having their legs and arms broken; after that we demanded the county authorities to furnish us with assistance to conduct the tagging.

DR. O'TOOLE: They provide us with tags and assistants in rounding up the animals and putting on the tags.

DR. FRENCH: What did you mean by saying that the owners did not demand an indemnity, Doctor?

DR. O'TOOLE: There is no indemnity provided for reactors in the California statutes.

DR. FRENCH: I thought all states were paying for diseased animals.

DR. O'TOOLE: These reactors were found and slaughtered and the only remuneration the owners got was the value of the carcass. The reason for that was that when they wanted to have that bill go over and become a law, it was thought impossible to have an indemnity clause included in it. They wanted that work undertaken immediately, and they did not think the bill would be enacted into a statute if it contained an indemnity clause. We have had no complaint at all about the slaughter of reactors. It is specifically provided in the law that they must be disposed of.

DR. FRENCH: We would be greatly handicapped in our state if we were to attempt to slaughter diseased animals without indemnifying their owners.

DR. LAMB: Dr. O'Toole did not give us the percentage of reactors in the range cattle. It would be of benefit to me, at least, to learn what the percentage was in the different classes of cattle. For instance, he termed some "range" cattle. I would like to know what percentage of reactors he found among them.

DR. O'TOOLE: The percentage of range cattle is less than one-half of one per cent.

DR. N. F. WILLIAMS: I take it that where you round up the cattle on the ranges under adverse conditions, you make use of a catch-pen and chutes.

DR. O'TOOLE: Wherever we can establish ideal conditions we do it; otherwise, we resort to the next best thing. If we can not have any kind of a chute provided, or have a pen of some kind to run them into, we round them up, but wherever possible we have adequate facilities.

DR. WILLIAMS: When a chute or pen is used at the time of the injection, what means of identification of the cattle do you have? How do you distinguish a cow which has been injected, from one which has not? Suppose you have eighteen or twenty cattle in the chute, and there is some commotion going on, how can you distinguish the injected from the non-injected cattle?

DR. O'TOOLE: When you assemble the animals in a chute you run them in at one end and out at the other end.

DR. WILLIAMS: That is not the question I had in mind. In vaccinating cattle in Texas, chute restraint is used. Some operators have the animal's tail bobbed simultaneously with the injection as a means of indentification. When the cattle are being released from the chute an unbobbed tail evidences an unvaccinated animal. We find quite frequently that we have missed vaccinating one or more of the animals that were in the chute. If you do not in some such manner identify the cattle which have been treated, what is your method of checking that feature?

DR. O'TOOLE: We have not experienced difficulty in that respect. There is not much chance of a man missing an animal.

DR. WILLIAMS: We have had such experience. For instance, a cow may go over the top of the others and through the changed position escape injection.

DR. O'TOOLE: We have always had sufficient help to see that the animals were guarded, that is, one kept behind the other.

DR. WILLIAMS: You are satisfied that that covers all of the possibilities?

DR. O'TOOLE: We feel that we have been successful in doing away with that difficulty to a large extent, at least.

DR. SULLIVAN: Our cattle-testing chutes are so constructed that one animal can not pass another. The chutes are eighteen inches wide at the bottom, and not over thirty-two inches wide at the top. They are made six feet high, and constructed of heavy forest timber, in most cases. We have a running board attached to the outside of the chutes on the left side and placed two and one-half feet from the bottom. The veterinarians use this running board in walking from one end of chute to the other in conducting the tests.

If the chutes are properly constructed and the cattle placed into the chutes in a careful manner there should be no difficulty in properly testing all cattle entering the chutes, if the veterinarian will exercise as much care as he would in the testing of a dairy herd.

DR. WILLIAMS: We find that cattle will persist in getting over the top, and some of them will get down on the grating, and we may not notice one of them that happens to be down. We are doing vaccinating work very satisfactorily in Texas with chute restraint. I was curious to know how you succeeded with chute restraint in tuberculin testing large herds rapidly.

DR. BARBER: I spent most of last winter testing range cattle and I used both the intradermic and the subcutaneous methods. I never saw a chute arranged so that one animal would not be able to pass another. There are big, broad-backed, short-horned cows and chutes have to be built sufficiently wide to enable such cows to get through and, where they are, there is always room for two thin yearlings to get by. That has been my experience. The kind of a chute we have used must be fixed so that the boys can catch each animal and hold it. You catch them by the head. You can not test in one of those chutes such as Dr. Williams says he uses in Texas. You can not test 1800 cattle in a day, unless you work eighteen hours. I put through 918 cows, caught each animal, and made an intrapalpebral injection.

DR. J. P. IVERSON: In answer to the speaker who has just preceded me, it would slow up the work, if each animal were fastened or secured by the head, as you have mentioned. It would almost retard the work to such an extent that it would not be practical to carry it out. I see no necessity for squeezing every animal. If the chutes are well built and the cattle are of uniform size you can crowd them into the chute, and it is rather rare indeed to have them go over the top. Not only is it rare for them to go over the top, but it is impossible for them to walk back and forth in the chutes, because they are made to prevent that very thing.

In the matter of ear-tagging, it is not the fault of the ear tag so much as it is the fault of the ear. The ear tears. The solution of that problem, and the solution of some other methods of identification, is hard to arrive at, unless we make an improvement in the ears of the cattle.

DR. BARBER: How much do you figure it would slow up the proceedings? How many cattle do you figure you should test in a day?

DR. O'TOOLE: In ten hours you should be able to test a thousand cattle. You will have to do a little extra work. The extra bruising of the cattle is

objected to by the owners. They do not like to have their cattle put through the squeezer. There is no necessity for it in our work.

DR. BARBER: That is not a squeezer. You fasten an animal by the head. The animals are run through in a uniform size. The chutes are so constructed that there will not be any passing back and forth.

DR. WILLIAMS: I believe that Dr. Barber's figures would coincide with the Texas figures. We find if we vaccinate one thousand calves in a day that we are going some. The intradermal test requires some care. Eighteen hundred in one day is extremely rapid work.

DR. O'TOOLE: I think we can cite some people who can test a greater number of cattle than that.

DR. SULLIVAN: In Idaho we tested 2375 range cattle from five o'clock in the morning until seven o'clock in the afternoon in one day. There were four veterinarians working on this chute.

After we have completed the testing of a chute full of cattle and a question comes up as to whether we have injected each animal in the chute, we check back on each animal to see if we have tested same before the head gate of the chute is opened.

HITTING AT CRUELTY

Seven months ago The Courier-Journal lent its voice in the support of a movement backed by the American Humane Association and other organizations aimed at bringing about the cessation of the cruel and senseless habit of cropping dogs' ears for show purposes. It is, therefore, gratifying to note the adoption of a resolution by the American Veterinary Medical Association to the effect that no dog whelped after January 1, 1928, shall be eligible for a prize if shown with cropped ears.

This should very shortly put an end to the practice since it strikes at the root of the matter—the competition of crop-eared dogs at bench shows. It is pleasing that the veterinarians—the men who made money out of the business of ear-cropping—have had the good sense to wipe out the stain on their profession of what the head of their organization designated as "illegitimate surgery."

The United States at last is to take its place alongside of England in this regard. British sportsmen thirty years ago barred crop-eared dogs from bench shows under the English Kennel Club rules, holding the practice to be cruelty and conducive to harmful physical effects on the dog. Since the veterinarians have taken the position that their efforts should be to relieve pain rather than to cause it, local kennel clubs and all real friends of dogs should get in line to stop the savage practice immediately. Dogs with ears are just as handsome as dogs with parts of ears. The knife cannot improve on nature.

Editorial in *The Courier-Journal*, (Louisville, Ky.)

TUBERCULOSIS ERADICATION IN THE NORTHWEST*

By SAMUEL B. FOSTER

Inspector-in-Charge, Tuberculosis Eradication Division, U. S. Bureau of Animal Industry, Portland, Ore.

In the solicitation of support for any project, a primary consideration is, or at least should be, the importance of its functions, and on this degree of importance should depend whether either a scant or a liberal expenditure of endeavor and money is granted for its furtherance. I believe that the measure of approval shown in favor of the tuberculosis eradication movement in the Northwest is indicative of a popular appreciation that the work is not only in the direction of a commercial benefit but is also an integral part of a present-day humanitarian service.

The limiting, controlling and eventual eradication of animal tuberculosis is a vital part of our agricultural economy and, as the work progresses, people are more and more changing their viewpoint from considerations of dollars and cents to that of hearts and souls.

We are at this time hearing a lot about evolution and perhaps that particular phase relating to human involvement is overshadowing all other considerations of the subject, but there is intended here to mention that close observation will lead us to the conclusion that there has been in this country an evolution in thought of a pure demonstrative kind, particularly along the line of sanitary efforts and ideals. Incorporated in this evolution are the mental workings of the farmer and cattle-owner, who has slowly but effectively exuviated his skin of self-damaging prejudice in favor of scientific methods of health improvement of his live stock, the most important being the control and eradication of tuberculosis. In the history of tuberculosis eradication in the Northwest, I recognize even in the short time of my own memory certain orderly and definite steps: First, a state of ignorance and consequent disregard; second, a gradual increase in public recognition that there is such a subject as tuberculosis eradication; third, appreciation of the fact that the movement is gaining momentum and the early organization of opposition against advancement; fourth, active efforts of the pioneer workers versus more organized opposition and cries of

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graft and medical persecution; fifth, the temporary cessation of opposition and slow advance through individuals and poorly organized agencies; sixth, the improvement in methods of tuberculin-test administration and the impetus given through national organization of the cooperative federal-state forces; seventh, the active operation of a nation-wide program on the accredited-herd and area basis; eighth, the consequent diminution in the percentage of bovine tuberculosis.

At this point, true to evolutionary tradition, we will either advance or retrograde and happily all indications are for advancement. The tuberculin-testing work is being largely turned back to private practitioners, acting in the capacity of accredited veterinarians, or as municipal, county or state employes, and the crux of the whole situation is fast entering their hands. If the appointments or titular designations are made with discretion, by someone who appreciates the full importance of the features of personal qualifications, then the project will be safe and America will continue to lead the world in this branch of veterinary science.

Voluntary Cooperation Basis of Success

The tuberculosis-eradication project in the Northwest was started with the idea that success should be anticipated through a program of inspiring voluntary cooperation, more than through drastic legal compulsions. Upon which of these two systems is inaugurated will depend a certain final effect. The adoption of a compulsory program in a territory unfamiliar with the work encourages antagonism and occupies the mind of the owner more with the spirit of resentment than that of cooperative effort. Perhaps under this system the test can at first be made more inclusive but it will not be so enduring. A well-polished badge too often acts as a glaring headlight in the eyes of the average farmer and invites a crash which will junk your progress in the very early stages.

The work in this part of the country was started among the various pure-bred herds and without laws of any appreciable effect. If the scope of the project were limited to these pure-bred herds it would have been ineffective from the standpoint of ordinary sanitary efficiency, as there would be the predominating grade herds left as sources of reinfection. From the voluntary acquired confidence emanating from these leading herd-owners, the work could not be destined to stand still, as popularity was

created and spread to nearly all the cattle-owners with the result that the test was demanded, necessitating an organization of veterinary personnel to handle the work. Whatever system is followed there always has been and always will be recalcitrant individuals, and when this group is definitely isolated and a survey made of the resulting menace a step is reached where the adoption of enforcement laws is in order. An indication that such a step has arrived is in the demand for laws *originating among the cattle-owners themselves.* The voluntary proposal of a law or regulation emanating from a farmers' meeting is a more healthy sign and augurs more success than a dozen laws enacted independent of their consultation, and today in Oregon we are acting under laws initiated by affiliated agricultural organizations themselves. Real success in the testing work will result only through the adoption of the circumscribed area plan and the activities here have been based upon this fundamental assumption. It may be necessary to begin with as small a sub-division as a local community and such was the initial work here, gradually enlarging to township limits and then to county boundaries until at present the area has increased to a strip comprising the western third of the State, embracing eighteen counties, each of which has at least one veterinarian and several having a staff personnel of as many as five veterinary inspectors.

Indemnity Feature Important

No matter how vital any public service may be, not excepting those bearing on human health, pecuniary considerations are going to bear some influence with the consequent limitation of the scope of activities. In this particular the indemnity feature of a tuberculosis campaign is of no minor importance. Oregon has adopted an indemnity schedule on a yearly, sliding-scale reduction, formulated on the theory that the need for indemnity appropriations should decrease in approximately the same ratio that our work increases, beginning this calculation at a time when the campaign has been in operation five years. After a five-year period the State has been covered and the percentage of tuberculosis should drop if the work has been efficiently conducted. The most troublesome man we have to deal with is the one who places only a monetary value on the loss of his tuberculous cow and he is the very individual on whom our reducing indemnity scale has the most desirable effect, as he very keenly appreciates the fact that delay in testing means a possible reduction in

his indemnity receipts and this is the man who is slowly but surely warming up to a few cold facts.

One of the most important considerations which should be taken into account by the directing official is that of where a campaign should begin. Full advantage should be taken of geographic barriers in the protection of cleaned areas from reinfection. The first area test conducted in this part of the country was in a county the entire area of which was confined to two islands in Puget Sound. In Oregon the campaign was started in the Northwest corner of the State, where it was protected on the west by the Pacific Ocean and on the north by the Columbia River. The area of operation was extended east and south, so that a clean, protected area was continually left behind.

The next step in the area program was to declare all the eighteen counties west of the Cascade Mountains under one area project. Examination of the physical features of this area shows that the Columbia River forms a line of protection on the north, the Pacific Ocean on the west, the Cascade Mountains on the east and the mountainous sections of California on the south. Each county included in this area project is required by law to appoint one or more veterinarians, who in turn are required to test all the cattle in their respective areas once each year, and in order to circumvent legislative opposition to increased taxation, a small official charge is made and turned into the county, tuberculin-testing fund, and we effect the desirable combination of furnishing employment to many veterinarians and at the same time rendering a valuable public service.

We in the Northwest believe we are doing our part in this wonderful movement of downing the tyranny of tuberculosis; and some day we are destined to proclaim this entire country a national accredited area, which recognition will be equalled only by the political significance of our great American slogan—"The Land of the Free."

DISCUSSION

DR. J. P. IVERSON: I was very much interested in Dr. Foster's paper; it indicates a broad, definite, constructive policy has been outlined. I believe they are going to arrive somewhere, at an early date, by having outlined so decisive a plan. I believe they will reach their goal more quickly than they would by attempting to eradicate the disease from the infected counties scattered throughout the State. The idea of utilizing geographical barriers is one which must not be overlooked by any state.

The Oregon plan of providing for a sliding scale in the matter of compensation, or indemnity, is splendid. When is it contemplated that the payment of indemnity shall entirely cease?

DR. FOSTER: This sliding scale is to be in operation over a period of seven

years. It is not entirely eliminated then. Five dollars is the minimum indemnity.

DR. IVERSON: After the expiration of the seven-year period, as I understand it, you will still continue to pay $5.00 minimum indemnity? I consider that a very constructive plan and a valuable one, although I do not think it will apply in every state. The matter of indemnity slows up the work between legislative appropriations. However, some of the states are not yet in a position to provide that sliding scale of protection.

DR. FOSTER: That sliding scale serves two definite purposes. There is a national cry for conservation and economy. We can get along better with the legislatures if we can show our work is progressing and our expenses decreasing, and that we are not calling for higher state taxation. It gives a better impression upon the people as a whole, and we can make more progress that way.

DR. IVERSON: I think there will be little argument on that point. The various regulatory departments are given excellent support by the public, and if we can show value received, indicative of the fulfillment of promises, further appropriations, when needed, may be obtained with little difficulty.

DR. FOSTER: Another point is that the men in the legislature inaugurated and instituted this law at the instance of the farmers' bodies and cattlemen's associations. Legislation of that kind, so instituted, will be much more successful and will enjoy more general obeyance than legislation proposed by persons not included directly in the cattle-breeders' fraternity.

DR. IVERSON: In our Free Area Law, in California, that does not happen to be the case. The California Cattlemen's Association advocated a compulsory plan, and constituted a body that was instrumental in having the law enacted. They knew it was impossible to have included an indemnity clause, and they agreed to accept it and stand their own losses. That, in a large measure, is the reason the work has been so successful during the last few years.

Any person who had a reactor received nothing at all from the State, and a number of them sold their reactors at a loss, as many of you know. There has been no "kicking" on that score; because it was their own proposition and their own legislation.

DR. C. H. HAYS: This sliding scale becomes effective after a certain period, as I understand it, and then, may I ask, is that effective over the entire State simultaneously, or just the part where the work has begun?

DR. FOSTER: It works over the entire State simultaneously, and each reduction in the sliding scale becomes effective on January 1. In five years, it will operate in this State under the minimum indemnity clause, and it has been reduced already—the first reduction effective a year ago. The yearly reduction is provided for in the state of Oregon indemnity law.

TUBERCULOSIS IN THE IRISH FREE STATE

An Associated Press dispatch from Dublin recently stated that tuberculosis in the Free State is gradually lessening, according to statistics. In 1919 one in about every 70 of the population was affected by some form of the disease, while in 1923 the proportion had diminished to about one in every 90. The decrease in deaths from all forms of tuberculosis in five years was 1,371. In 1923 the tuberculosis death rate was 1.41 per 1,000.

REASONABLE

A British veterinary surgeon asserts that a Pomeranian puppy fed on fruit salad will grow as large as a large fox terrier. That being true, a great Dane fed on fruit salad should become as large as a large mule.—(Louisville, Ky., *Times.*)

COUNTY HERD INSPECTION WORK IN OREGON*

By W. H. LYTLE, *State Veterinarian*
Salem, Oregon

County tuberculin test work in Oregon, as a county unit, dates back to the year 1917, at which time there was passed in the Oregon legislature an act known as the Tillamook County Herd Inspection Law. This law was conceived by various cattle owners located in Tillamook County and was an outgrowth from an attempted general tuberculin test of the cattle of the county. It was found that it was quite difficult to carry out such a project when forced to depend upon the services of either the state or federal government. At that time state sanitation was not carried on with the vigor that it is at the present time, and so, early as 1917, the federal government was not participating to any general extent in county tuberculosis eradication work.

The idea of this county herd inspection law was to maintain the office through a per-head-fee charge, which money for tests was to be collected by the County Herd Inspector and turned over to the County Treasurer, for the benefit of the county herd inspection fund. Just how the fee charge of 15 cents per head was arrived at I do not know, but I presume it was a compromise fee and was thought to be sufficiently small for no one to object to it. Provisions were made in the law for the appointment of a county herd inspector who, within his county, had full powers and duties of a deputy state veterinarian. He was to be approved by the State Veterinarian of Oregon, was required to file a bond and to meet certain educational requirements, and was to be paid a maximum per diem of ten dollars per day. The herds of the county were to be tested annually. There are some 13,000 cattle in Tillamook County, which is somewhat isolated, but in which county the herds are considerably larger than they average throughout the State. It was found that it cost approximately 24 cents a head to carry on the test work in Tillamook County, attend to the disposal of reactor animals and superintend the disinfection of premises. The deficit arising between the moneys realized from fees and the total cost was paid from the county funds.

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The particular thing that I wish to emphasize and call attention to was the desire of the framers of this law to eradicate not only tuberculosis but other infectious diseases of cattle and at the same time furnish sufficient inducement for the location, in their county, of a well-qualified and competent veterinarian, who would also be available for general practitioner services.

The growth of this movement has continued here in Oregon. At the 1919 session of our legislature there was an optional blanket county dairy herd and meat inspection law passed, which embodied the features of the Tillamook County Dairy Herd Inspection Law and made it optional with the counties of the State to elect, through a vote of their county courts, to order the compulsory testing of the herds carried out under the term of that act. The only practical difference was that a fee of 35 cents per head was provided for, instead of the 15-cent fee of Tillamook County.

Testing Not Compulsory

Several of the counties elected to come under the provisions of this act and did carry on test work for a year or more, but inasmuch as there was no provision in this law which made it sufficiently compulsory to force those who refused to have their animals tested to test, the herd work of this measure was not as satisfactory as it apparently would be under a specific and more drastic county act. Consequently, Coos and Polk counties had county laws enacted at the 1921 session of the legislature and Tillamook County strengthened the compulsory feature of its law. These counties, being located in various widely separated districts in western Oregon, served as educational centers and through a relatively satisfactory carrying out of these laws other counties became interested and at the 1923 session of the legislature four other counties in western Oregon passed similar county herd inspection laws. I might add that, with the exception of Tillamook County, all of these counties provided for a per-head-fee charge of 35 cents. This amount was found adequate to carry on the work.

It has been the policy of the counties to pay the Herd Inspector and his assistants ten dollars per day, which moneys were to cover the per diem salary and expenses. In some counties a car was furnished the Herd Inspector by the county court free of cost; in other counties the Herd Inspector was forced to furnish his own car.

The test work in the seven western Oregon counties resulted in the testing of practically all of the dairy cattle in these seven counties and coupled with the test work that the U. S. Bureau of Animal Industry veterinarians were doing and through sentiment from the educational influence that had resulted from some fifteen years of continuous cooperative tuberculin test work by the U. S. Bureau of Animal Industry, there was now a general demand for a state compulsory tuberculin test law. The difficulties that would arise from such a law in a state where upwards of 600,000 range animals run were obvious to those who had had more or less experience with tuberculosis control work, and in order to effect a compromise it was suggested that, that portion of the state of Oregon which lies west of the Cascade Mountains, and which contains practically four-fifths of the dairy animals of the State, be placed under a compulsory tuberculin test law.

In attempting to arrive at a satisfactory uniform county herd inspection law for all of the counties in the west Cascade section of our State, it was found that there was a considerable desire on the part of several of the counties, that had specific county herd inspection laws all ready passed, to have their work continued under these laws. There was a desire on the part of other counties embraced in this territory to enact specific county herd inspection laws for their counties.

Supplementary Law Enacted

In order to force all of the territory into compulsory county herd tuberculin test work, it was thought to be both constitutional and of good policy to enact a supplementary tuberculin test law for all of those counties lying in the west Cascade district in Oregon that did not have specific county tuberculin test laws or did not pass such laws at the present session of the legislature. There had been a disposition on the part of some of the dairymen of the counties not to have a specific law passed, because they were desirous of getting the test work done by either the state or the federal officials free of cost, or at least at a cost no greater than the transportation fees, which had been previously collected by the various farm bureau officials in amounts of approximately ten cents per head.

In order to make such a supplementary law workable, in the counties desiring free testing, it was quite generally conceded that there would have to be some provision made, whereby a fixed fee would be charged for all animals tested in these counties,

regardless of whether or not the work was done by a federal or state or assistant state veterinarian, making provision that such fees as might be due and collectable be paid into the County Treasury as taxes, for the benefit of the county herd inspection fund in such counties. Provision was placed in the law whereby no compensations were to be paid for such test work as might be done by either federal or state officials, other than transportation expenses of federal veterinarians who were engaged in this work within such counties and in order to avoid a question of the constitutionality of a charge being made by a state or federal veterinarian, the fee was charged for the tagging and marking of the animals, rather than for the testing of the same, and the amount due was to be extended to the tax rolls and collected as other taxes are collected. A fixed fee of 25 cents per head was named in the law for this work and the act was to be applicable to all counties in the west Cascade region of Oregon that had not already enacted a specific county herd inspection law or which did not enact such laws at the 1925 session of the legislature.

Range Animals A Problem

An additional problem had arisen in certain counties already having county herd inspection laws. The county herd inspection laws were primarily aimed at the dairy and pure-blooded breeding herds of the county. No mention was made of the range animals of the State and in some of the counties there were a considerable number which in various districts associated more or less closely with the tuberculin-tested dairy herds of the county. The problem of testing range beef animals is a somewhat troublesome one when it is necessary to gather such animals up and hold them for a period of time sufficiently long to make the necessary observations. Naturally there were strenuous objections made to such a measure by the beef industry of these counties. A compromise was finally arrived at, whereby the beef animals of the county were to be exempted from the tuberculin test, so long as they did not come in contact with tuberculin-tested dairy animals of the county. This concession was made only because of the danger of defeating the measure and the known small extent of tuberculosis in the range herds, which runs less than one-half of one per cent (.5%) of infection.

There is nothing particularly striking about the system that we have used here in Oregon and it doubtless differs only in a small way from the various county herd inspection projects that

have been carried out in other states, wherein the free-area tuberculosis eradication work is being carried on. Outside of the supplementary tuberculin test law, some eleven county herd inspection laws that we now have probably differ but slightly. In all of these counties some federal tuberculosis test work has been carried on at the same time that the test work has been carried on by the County Herd Inspector and his assistants.

It is only natural that some dissatisfaction arises when the work is done free of cost by the federal or state officials for some owners and another owner is forced to pay the County Herd Inspector 35 cents per head. One county did pass, at the 1925 session of the legislature, a special county herd inspection act which makes provision that the herd inspector be paid from funds out of the county budget, derived of course from general taxation. This would be the ideal plan to carry out were it possible to get the legislature to enact such a law for the various counties, but there is a general tendency to lower taxes rather than to increase them. So long as the herd work is carried on by fees collected from the owner, in the form of a direct tax, there is little or no objection on the part of the legislature to the passage of such a county law.

Work Should Be Divided

In my opinion the ideal county herd inspection law is one which would divide up the work between the county, the state and the federal governments, which would be carried on by county herd inspectors appointed from the best qualified practitioners of the county, supplemented with federal veterinarians and veterinarians in the employ of the state. In my opinion the county should test approximately one-half of the animals. The federal government and the state each should test approximately one-fourth. This work could best be carried on in an intensive manner because the organization work that is necessarily preliminary to a test can be best arranged for as a complete county project. The advantages of a mass test are very obvious from the standpoints of publicity and general public sentiment as well as the carload disposal of reactors. Especially is this true when reactors are to be moved from a district quite remote from the large packing centers.

Our laws, which provide for indemnity, are quite similar to various other state sanitary laws and possibly differ in that there is a sliding indemnity scale which decreases from year to year.

One-third of the difference between the appraised value of the animal and the salvage value was used as a basis for computation with certain maximum limits until this year, when the one-third was by statute changed to one-fourth and the maximum limits were cut from $35 for pure-bred animals to $30, and from $18 for grade animals to $14, for the calendar year 1925. This provision was passed several years ago in the hope that it would stimulate more general testing, but I would not advise any state to make use of it, because it is difficult to raise the indemnity maximums after they have once been lowered, and it naturally arrives at an indemnity maximum the amount of which is not fair to the owner.

It is our plan to gather breed data so that they may be placed at the disposal of the various breed organizations and may assist in working out breed centers throughout the State. We intend to catalog all of the pure-blooded and grade bull owners throughout the district and attempt to carry on grade bull replacement campaigns by means of these data.

Bovine tuberculosis has steadily decreased throughout our State under the various forms of county test projects and we now have our percentage of reactors reduced so that a summary of 220,000 cattle tested the last biennium showed but slightly more than one per cent of tuberculosis. Some fourteen years ago the percentage of tuberculosis in the immediate vicinity of Portland ran upwards of twenty-five per cent. Today it is less than three per cent and, as time goes on, we hope to have it almost completely eradicated.

DISCUSSION

DR. N. F. WILLIAMS: Dr. Lytle, how many years have you been reducing the percentage of tuberculosis from 25 per cent to 3 per cent in Oregon?

DR. LYTLE: I might say that 25 per cent should not be tken as a true estimate of the extent of tuberculosis in Oregon, fourteen years ago. In Multnomah County, the percentage of tuberculosis was 25 per cent, but in the remainder of the State it was approximately 3 per cent. We have really reduced the percentage of tuberculosis throughout the State from 3 to 1 per cent, and in Multnomah County from 25 per cent to approximately 2 per cent.

DR. J. P. IVERSON: Does the law provide that all counties west of the Cascades shall undertake the work simultaneously, or is it optional with the county?

DR. LYTLE: The law requires that all animals shall be tested once each year. It does not say when the calendar year shall start, but I presume it starts the first day of January.

DR. IVERSON: Then it is mandatory that all of the counties shall do the work and it is not optional with the county to defer it for two years or six years? I would like to add that your paper, to me, indicates that you have an intelligent grasp of the situation regarding the control of tuberculosis in Oregon, and I think you are doing a splendid work.

DR. C. G. LAMB: There is one feature about the Oregon law that seems peculiar to me. Possibly their Constitution is different from that of other states,

but the puzzling feature to me is that the legislature of Oregon can pass a law applicable to certain sections of the State and not applicable to the State as a whole. Legislative acts, as I have always understood them, in order to be constitutional, must affect all people alike, and it seems peculiar to me that it is possible for the Oregon legislature to pass a law that applies to certain sections of the State and not to others.

DR. C. H. HAYS: A little incident occurred in Nebraska recently. We had a case in court and the counsel for the defense evidently was of the opinion that he was going to fight his case from a constitutional standpoint, and he brought out this point: We had a law passed which was operative on the basis of the county, that is, if 60 per cent of the population of the county desires that this law be applicable to the county it then becomes operative. He took the stand that the law was not constitutional and was delegating to the county the privilege of making a law for the county and that law might be applicable and in operation only in that county and not the rest of the State. In other words, any law must be made operative throughout the whole State, and this law, he contended, was unconstitutional, because it attempted to give to the people the privilege of making a law.

The Judge, not favoring us in any way, stated he thought the point as to the constitutionality under discussion by counsel for the defense was irrelevant and that under the circumstances and the nature of the law, it could be operative in one county or in more than one county, if 60 per cent of the citizens of each of the counties decided that they wanted it. This was an opinion expressed by the County Judge in a session of the County Court.

DR. LYTLE: I might say, in further answer to Dr. Lamb's question, that we had no test case of this act. It has been attempted, but the attorneys who represented the parties who were attempting to question the constitutionality of the law, after reading an opinion of our Attorney General, apparently became of the belief that it would be useless to attack the constitutionality of the law. I do not know that our Constitution differs greatly from the constitutions of the other states. Our Attorney General gave an opinion that so long as the dairy owners in a specific unit—like a county—decided that they wished to operate under the law, it was constitutional; but he said that if a part of the dairy owners in the county were to be required to test, then the law would be unconstitutional. All of the owners in that unit must be equally dealt with—the law must apply to them impartially. While we have no decisions that really take this case into consideration, we have other cases which are precedents and from which it appears that our act is constitutional.

DR. WILLIAMS: Is this operation in the state of Oregon supposed to be a systematic eradication of tuberculosis? We have local laws that affect certain dairies, and require compliance from certain parties involved and not from others.

DR. LYTLE: Up until the last session of our State Legislature, which body enacted a supplementary West Coast or Cascade tuberculin test law, our test work could not be considered systematic except in certain counties. The supplementary test law made it mandatory for all counties in this west Cascade district, which district comprises practically 90 per cent of the dairy territory of the State, which did not already have specific county test laws, to come automatically under the blanket provisions of this law. The range, beef animals in a few districts in this territory are not required to be tuberculin tested unless they come in contact or mingle with tested, dairy stock or pure-bred, beef animals. The testing of all beef animals is something that will have to be worked out in the future. The majority of the counties are such that range animals are not harbored therein.

BAKERESQUE

"Do you know what I herd?"

"No."

"Sheep."

"Funny I didn't hear 'em."

BLOOD-PRESSURE AND ITS APPLICATION IN CANINE PRACTICE*

By J. G. HORNING *and* A. J. MCKEE, *Houston, Texas.*

So many requests have been made for a more simplified article on blood-pressure work that we decided to write a supplement to the article already published in *Veterinary Medicine*, and in this answer the numerous questions that have been asked us about this work. For those who do not have their old file to refer to, we will first give a short résumé of the first article.

Instrumentation: The most accurate instrument is the mercury type, the writers preferring the Baumanometer, used in conjunction with the special sleeve devised by one of us (J.G.H.), and the handiest for carrying with you on calls is the aneroid type, of which there are several good makes on the market. In our work we use the Baumanometer for hospital work and the aneroid type for work at the home. We make a test of our aneroid instrument every day. To insure accuracy, this can be done with a rubber Y-collector, allowing the attachment of aneroid and Baumanometer.

Technic: The dog should be placed on his right side, on a table or the floor, and the cuff applied at the highest point possible on the left hind leg, special care being taken in tightening the straps of the cuff to see that equal pressure is applied over the area covered by the cuff. By having an attendant or the owner hold the dog in the recumbent position, the bulb and dial are held by an assistant, while the leg is grasped by the operator and the femoral artery palpated, between the stifle and hock, with the right hand, while the artery is palpated on the foot with the left hand. As soon as the pulsation is detected, at a nod of the head the assistant exerts a steady pressure on the bulb, inflating the cuff with air until the operator is no longer able to get a pulsation. He then makes his reading at the point where the column of mercury or the hand on the dial rests. This gives him the systolic pressure, when, at another nod, the assistant releases the air slowly and evenly. As soon as the operator again feels the pulsation he notes the position on the column or dial and this gives him his diastolic pressure. Then the entire amount of air is released from the cuff and it is removed.

*Presented at the fifteenth annual meeting of the Texas State Veterinary Medical Association, College Station, Texas, June 15-20, 1925.

Blood-pressure being individual and influenced by inherent physical characteristics, several readings under as nearly like conditions as possible are desirable when determining true normal, which is of the greatest value in diagnosis. The following is a table of averages based upon a series of observations to determine the normal blood-pressure of dogs:

Weight	Systolic	Diastolic
5–15 lbs.	105	73
15–30 lbs.	110	77
30–40 lbs.	112	78
40–50 lbs.	113	79
50–60 lbs.	120	84
60–70 lbs.	124	86
70–80 lbs.	126	88
80–90 lbs.	130	91
90 lbs. up	136	95

Hypertension is an abnormal rise in blood-pressure, and is noted in pneumonia, distemper, bronchitis, nephritis, meningitis, asthma, toxemia, lead and arsenic poisoning, constipation, tympanites, cecitis, eclampsia, spirochetosis, ictero-hemorrhagica and hydrophobia. Hypotension is an abnormal decrease in blood-pressure, noted in filariasis, ascites, different types of paralysis, hemorrhage, rachitis, yellow jaundice, valvular insufficiency, later stages of hookworm infestation, later stages of ptomaine poisoning, and later stages of all febrile diseases.

What are the relations of the systolic and diastolic pressures from a diagnostic standpoint? The systolic pressure means nothing from a diagnostic standpoint, as it is subject to too much variation. The least bit of excitement, a too-full stomach, violent exercise, or any slight nervous disorder may cause the systolic reading to be very high. It reflects the strain to which the arteries are subjected but the diastolic pressure indicates the real work the heart has to do and is valuable in determining whether organic, vascular or cardiac changes are present, as this pressure is more constant and is not so easily disturbed. In our work we go mostly on the diastolic readings, as all dogs, when first brought into the operating room, usually run a high systolic pressure.

Functional rather than structural changes form the basis of modern diagnosis, because dogs, like machines, show mechanical impairment before the break-down. Blood-pressure is the fore-

most functional symptom. It is often the silent guide to impending attack. We have had cases examined where the temperature would be normal, respiration normal, pulse normal, but showing an abnormal diastolic pressure. We were thus able to forecast an impending attack and, in receiving hospital cases, place the dog in the observation ward for checking up, so that in case of an infection he could then be kept from the possible infection of other cases. Our prognosis in these cases is more guarded and, being posted as to some danger, we are on the lookout and can institute earlier treatment.

Precautions to be Observed

When possible, readings should be made about the same time of day and in the same relation to meals. However, by thoroughly questioning the client in regard to the patient, allowance can always be made for over-exercise, full stomach and any nervousness. Give instructions to the client for the preparation of the patient by the time of the next reading, if examined at the house; or properly time the examination, if at the hospital. If one would remember to pay but slight attention to the systolic and concentrate on the diastolic pressure, chance for error is very slight.

In the bitch, during the period of estrum, it is well to bear in mind that the blood-pressure frequently rises a day or two preceding this condition and is lowest during the sixth day. In spayed bitches there is an increased blood-pressure, as much as 15 mm. above normal, for a normal bitch of the same size. This is reversed in dogs that have been castrated, although we have never found the diastolic pressure lower than 10 mm., in comparison with a normal dog of the same size. In pregnancy, where the blood-pressure is higher than normal but unaccompanied by albuminuria, we resort to free purging, which usually restores it to normal. In old dogs, where a high diastolic pressure is noted, if the patient is not watched, there will be signs of eclampsia.

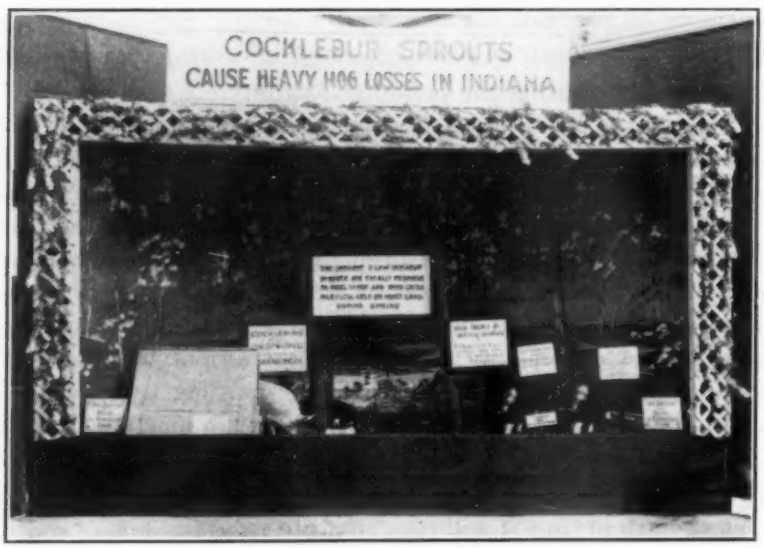
The length of time it will take to master the technic, of course, depends upon the operator. We would suggest that the operator get a dog that is not nervous and practice on this dog until it becomes easy for him, and he finds, in checking up on his readings, that they are somewhat constant. One afternoon's work should give him enough confidence to institute regular readings on the patients he has to examine.

Age has its effect on blood-pressure, but it is not so noticeable

in dogs as in human beings. In the majority of cases, in old dogs, it varies from 5 to 10 mm. higher than the normal pressure given, unless the dog is extremely old, when the reverse is noticed. The operator, in this case, has to take into consideration the general appearance of the patient. In pups we have been limited in our examinations on account of the size of our cuffs, having had to confine the readings made to pups of the larger breeds, but there was a higher pressure noted in pups six weeks to three months old than the normal readings on dogs of the same weight but more matured.

POISONOUS PLANT EXHIBIT

The accompanying photograph shows a view of an exhibit at the Indiana State Fair, held in Indianapolis, September 7-12, 1925. The exhibit featured the poisonous properties of cocklebur sprouts, the cause of rather heavy losses among live stock in Indiana and adjoining states, the past year. The poisonous



Poisonous Plant Exhibit at Indiana State Fair

stage of the sprouts was shown growing alongside a running stream of water, and the effect was very striking. The exhibit was put on by the Department of Agricultural Extension, and, according to Professor Albert A. Hansen, of the Division of Botany, was viewed by over 200,000 people.

CRITICAL TESTS OF TETRACHLORETHYLENE, A NEW ANTHELMINTIC, WITH SPECIAL REFERENCE TO ITS USE IN PUPPIES

By A. S. SCHLINGMAN

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Based on the results of their work on dogs with chlorin derivatives, as anthelmintics, Hall and Shillinger[1] recently recommended the cautious use of tetrachlorethylene (C_2Cl_4) for the treatment of human ancylostomiasis.

In a later publication[2] these authors recommended tetrachlorethylene as being apparently as good as, and perhaps slightly better, for the removal of hookworms from dogs, than carbon tetrachlorid (CCl_4), a closely related chlorin compound which was first recommended by Hall[3] and which has since come into widespread use for that purpose in both dogs and man.

In summarizing their work with tetrachlorethylene the authors state that "the contraindications for tetrachlorethylene will probably be identical with those of carbon tetrachlorid and include: distemper or other febrile diseases, mange, or other debilitating diseases, liver lesions, extreme youth or old age, and gastro-enteritis, especially hemorrhagic forms. Liver lesions have been found to follow the administration of tetrachlorethylene. A high carbohydrate diet would probably be protective as Davis (1924) found it for carbon tetrachlorid, and a diet of fats, oils, cream, etc., contraindicated; the available evidence does not indicate that a high proteid diet is contraindicated."

Bearing in mind particularly the fatalities which sometimes occur following the administration of carbon tetrachlorid to puppies, the tests on this new anthelmintic were carried out mainly on puppies of about three to four weeks of age.

For the most part these young animals were received along with the mothers and, with the exception of the first four used, were kept in individual cages during the time they were under observation, being removed to nurse at regular intervals. Those puppies which had been removed from the mother before arrival at the laboratory were fed whole milk entirely, a food which, according to recommendations, was contraindicated.

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In the case of these younger animals, they were not starved before being given the anthelmintic, but the older dogs used were fed sparingly the night before receiving the tetrachlorethylene. No particular effort was made to limit the diet of these animals, either before or after the anthelmintic was given. The food consisted of meat, cereal and milk.

It was thought that in carrying out these experiments, the tests, especially those of safety, would be made more severe if no purgative was used at the time of or shortly after the administration of tetrachlorethylene. As a result of this decision, all the results recorded were obtained following the administration of tetrachlorethylene alone.

No check could be made as to the efficiency of the anthelmintic on the puppies in table I, because they were not kept in individual

TABLE I—*Tetrachlorethylene at rate of 0.3 cc per kilo to pups three weeks of age.*

No.	Weight (kg.)	Worms Postmortem	
		Round	Tape
1	0.82	1	1
2	0.82	6	0
3	0.95	9	0
4	0.90	11	0

cages. However, the dose rate used was not excessive, since no toxic symptoms were shown. Autopsies were held fourteen days following administration of the tetrachlorethylene.

In the next litter of four puppies (table II), the dose of tetrachlorethylene was increased to 0.5 cc per kilo. On postmortem, four days later, the internal organs were all apparently normal.

TABLE II—*Tetrachlorethylene at rate of 0.5 cc per kilo to pups three weeks of age.*

No.	Weight (kg.)	Worms Passed		Postmortem
		Round	Hook	
5	1.81	1	11	0
6	1.02	11	0	0
7	0.92	21	0	0
8	0.90	6	0	0

The experiments tabulated in tables I and II were repeated on another litter of six puppies, three receiving tetrachlorethylene at the rate of 0.3 cc per kilo and three at the rate of 0.5 cc per kilo (table III). No apparent changes were noted in the internal organs when autopsies were held six days later.

TABLE III—*Tetrachlorethylene at rate of 0.3 and 0.5 cc per kilo to pups same age as tables I and II*

No.	Weight (kg.)	Dose per kg. (cc)	Worms Passed			Postmortem		
			Round	Whip	Hook	Round	Whip	Hook
9	1.02	0.3	12	0	11	0	0	0
10	0.90	0.3	0	0	0	0	0	0
11	0.83	0.3	1	2	2	5	0	0
12	0.82	0.5	1	0	3	1	0	0
13	0.82	0.5	1	0	0	0	0	0
14	0.90	0.5	6	0	0	0	0	0

To determine the safety of relatively large doses of tetrachlorethylene, the four puppies in table IV were given the drug at rates varying from 0.8 cc to 5 cc per kilo. On autopsy three days later no macroscopic deviation from normal was noted in

TABLE IV—*Safety and efficiency of tetrachlorethylene in doses of 0.8 cc to 5 cc per kilo to pups three weeks old.*

No.	Weight (kg.)	Dose per kg. (cc)	Worms Passed		Postmortem	
			Round	Hook	Round	Hook
15	0.90	0.8	3	0	1	0
16	0.62	1.0	22	10	0	0
17	0.80	3.0	21	7	0	0
18	1.22	5.0	4	2	0	0

any of the internal organs, even though these puppies received from 4 to 25 times the recommended effective dose of 0.2 cc per kilo.

The two pups in table V had been weaned and were in exceedingly poor condition at the time of arrival at the laboratory. Pup 20 died three days after receiving the tetrachlorethylene and on autopsy showed slight evidence of degenerative changes in the liver. Autopsy of pup 19, one day later, showed nothing abnormal.

TABLE V—*Pups three weeks old; dose 0.2 cc per kilo*

No.	Weight (kg.)	Worms Passed			Postmortem		
		Round	Hook	Tape	Round	Hook	Tape
19	0.72	34	4	0	2	0	0
20	0.46	3	0	6*	6	0	1

*segments

To determine the effectiveness and safety of this new anthelmintic for larger pups, six animals (table VI) aged about three months each and one aged about six months (pup 28) were given the

drug in doses varying from 0.2 cc to 10 cc per kilo. Autopsies were held on pups 21 to 25 five days later, while those on the

TABLE VI—*Safety and efficacy for pups three and six months old; tetrachlorethylene administered at rate of 0.2 cc to 10 cc per kilo*

No.	Weight (kg.)	Dose per kg. (cc)	Worms Passed		Postmortem		
			Round	Hook	Round	Hook	Tape
21	5.3	0.2	77	35	0	0	0
22	4.1	0.3	5	0	0	0	0
23	4.0	1.0	1	2	0	0	0
24	4.0	5.0	2	5	0	0	0
25	3.72	10.0	7	0	0	0	0
26	7.0	0.2	4	6	12	0	2
27	4.5	0.2	8	3	0	0	0
28	4.5	0.3	0	0	0	0	0

remaining ones (pups 26 to 28) were held on the sixth day. The internal organs of these seven pups were apparently normal, although pup 28 was used on account of being in the beginning stages of distemper.

Three adult dogs, aged about 2 years each, were given tetrachlorethylene at the rate of 0.2 and 0.3 cc per kilo (table VII). These animals were autopsied three days later, when no abnormalities were noted in the internal organs.

TABLE VII—*Tetrachlorethylene to adult dogs at rate of 0.2 to 0.3 cc per kilo*

No.	Weight (kg.)	Dose per kg. (cc)	Worms Passed			Postmortem			
			Round	Hook	Tape	Round	Hook	Tape	Whip
29	10.0	0.2	12	2	5*	20	0	5	6
30	7.0	0.3	0	4	0	0	0	0	0
31	13.4	0.3	4	7	0	1	0	0	3

*segments

From these experiments it will be noted that the dosage of tetrachlorethylene for the younger puppies varied from 0.2 cc to 5 cc per kilo; for the larger puppies 0.2 cc to 10 cc per kilo, with a dosage of 0.2 cc and 0.3 cc per kilo for the remaining adult dogs. During the time these animals were held under observation no toxic symptoms whatever were shown. No vomition occurred even in cases where relatively large amounts were given, as in dogs 18 and 25.

In the animals used, the tetrachlorethylene, in the doses given (0.2 cc to 10 cc per kilo), was 100 per cent effective for hookworms and had an average efficiency of 87.7 per cent for

roundworms in 25 cases. In the remaining 6 cases no check as to efficacy was obtained on account of not having the animals separated or because no worms were passed and none were found postmortem.

Its effectiveness for whipworms seems variable, having removed all from one case and none from two others.

No tapeworms were removed by the tetrachlorethylene.

It is interesting to note the 100 per cent effectiveness of a dosage of 0.2 cc per kilo in dog 21 which passed a total of 77 roundworms and 35 hookworms.

While a lower dose rate than 0.2 cc per kilo was not used, this dosage was 100 per cent effective against hookworms in all cases. These findings are in keeping with those of Hall and Shillinger, who state that "all that we can conclude is that the existing data suggest that tetrachlorethylene may be slightly more effective than carbon tetrachlorid for the removal of hookworms from dogs and that in the case of tetrachlorethylene, the indicated dose rate of 0.2 cc per kilo is rather definitely established by the experiments in which this dose rate was used."

In their original article,[1] Hall and Shillinger say that "the safety of the drug would probably be very close to that of carbon tetrachlorid and the drug would probably produce the same lesions, usually a hepatic necrosis healing in the course of one to two weeks, and would have the same contra-indications."

Later[2] they state: "On the basis of a 0.2 cc per kilo dose rate for tetrachlorethylene and a 0.3 cc dose rate for carbon tetrachlorid we have been inclined to regard tetrachlorethylene as possibly somewhat safer than carbon tetrachlorid, but on reconsideration of the data we are inclined to reserve judgment on this point."

From the results obtained in the work included in this paper it would seem that tetrachlorethylene is much more safe than is carbon tetrachlorid, especially to the younger animals.

In a previous work[4] it was found carbon tetrachlorid in doses in excess of 0.26 cc per kilo caused death of puppies, four weeks of age and under, within 24 to 48 hours. Tetrachlorethylene in varying doses up to 5 cc per kilo, in puppies of equal weight and size, caused no toxic symptoms and did not cause the death of these small and very young animals.

Only one of the twenty puppies used (pup 20) died following the administration of the tetrachlorethylene. This particular animal, on arrival at the laboratory, was in a very poor condition, evidently having been removed from its mother some time pre-

viously. The puppy was in practically a moribund condition at the time of dosing with 0.2 cc per kilo. At no time during the three days this animal lived did it take any nourishment. On postmortem some macroscopic degenerative changes were noted in the liver, this being the only one of the entire series in which such changes were found. It is possible, however, that such conditions would have been noted in others had microscopic examinations been made.

When administering carbon tetrachlorid to dogs it is always necessary to guard against accidental breakage of the containing capsule in the animal's mouth. Accidents of this sort have been followed by suffocation and death of the patient due to inhalation of carbon tetrachlorid.

An accident of this sort occurred while administering tetrachlorethylene to dog 29, the entire contents of a 1-cc capsule escaping into the mouth. No bad effects were later noted.

To determine further the effect of free tetrachlorethylene in the mouth and upper respiratory tract, 1 cc of this drug was released from a pipette into the larynx of a dog weighing about 7 kilos. No ill effects other than a slight cough were noted.

Another dog was injected intratracheally with 1 cc of the tetrachlorethylene. Almost immediately coughing and retching occurred. Within one minute the dog had vomited and become very dyspneic. The respirations ceased almost entirely for about one minute during which time the visible mucous membranes became very cyanotic. During the entire time these paroxysms were lasting, the animal remained standing. Complete recovery took place in eight minutes. It is evident that the symptoms produced as a result of this intratracheal injection were due to the mechanical action of the tetrachlorethylene, since no further symptoms were noted during the succeeding 24 hours.

This difference in effect of the free drugs is no doubt due to the fact that tetrachlorethylene is considerably less volatile than is carbon tetrachlorid, the former having a boiling point of 121-122°C. while that of the latter is about 77°C.

Of additional interest as to the effects of tetrachlorethylene are the observations made by the author and his assistant, each taking 1 cc of the drug. In the case of the former, the drug was taken in a hard gelatin capsule about three hours after a breakfast consisting of coffee, cereal, fruit and cream. About fifteen minutes after taking the tetrachlorethylene a slight dizziness accompanied by an eructation of the taste of the drug was

noted. Both these symptoms persisted about fifteen minutes, after which nothing further was noted. Five grains of phenolphthalein were taken about one hour after the tetrachlorethylene.

In the latter case, the drug was taken one and one-half hours after lunch, followed in one hour by one grain of phenolphthalein. No effects were noted except the eructation of the taste of the drug which persisted only a short time.

Summary

Tests on 31 puppies and dogs indicate that tetrachlorethylene is as effective as carbon tetrachlorid for the removal of hookworms from dogs, the drug removing all of these worms present.

In these experiments tetrachlorethylene had an average efficacy of 87.7 per cent against ascarids in 25 cases. In the remaining six animals no check was obtained because of not being able to separate them, or because no worms were passed and none were found postmortem.

The effectiveness of tetrachlorethylene against whipworms was variable, removing all from one case and none from two others.

No effect on tapeworms was noted.

The safety of tetrachlorethylene for puppies is higher than that of carbon tetrachlorid, the former drug being given in doses approximately 20 times the therapeutic dose of carbon tetrachlorid (0.26 cc per kilo) for these smaller animals.

To puppies under four weeks of age, tetrachlorethylene was given in doses ranging from the therapeutic dose of 0.2 cc per kilo to 5 cc per kilo, or 25 times the former, without any deleterious effects.

Older puppies (3 months) did not show any untoward symptoms following the administration of tetrachlorethylene in doses varying from 0.2 cc to 10 cc per kilo.

The diet, consisting of the mothers' milk, meat, cereal and milk, apparently had but little effect on the safety or efficacy of the tetrachlorethylene in the doses given.

On account of its apparently high safety, and its efficacy for the removal of hookworms from the puppies used in these experiments, tetrachlorethylene deserves further cautious use for treatment of human hookworm diseases, especially those of children.

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CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

VALUE OF DYES IN THE TREATMENT OF ANTHRAX SEPTICEMIA

By VICTOR BURKE
and
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The need of a chemotherapeutic agent for the treatment of anthrax infection in stock is obvious. The cost of anthrax immune serum is almost prohibitive for the curative treatment of ordinary stock. An outbreak of anthrax means the loss of a number of animals before complete immunity can be developed by vaccination. Vaccination of uninfected herds occasionally results in some loss, due to the virulence of the vaccine or special susceptibility of a few individuals in the herd. A cheap chemical disinfectant that can be used to save such animals should be of value.

Recent work has shown that certain dyes, particularly the tryphenylmethane and acridine dyes, are powerful disinfectants and can be used intravenously with marked results in the treatment of various kinds of septicemia. We find no record of dye having been used in the treatment of anthrax septicemia. Churchman[1] first demonstrated that gentian violet would inhibit *Bacillus anthracis* and kill many of the cells. To determine the bactericidal action he stained suspensions of the organisms and injected the stained organisms in mice. Death was delayed but not prevented. Burke and Skinner[2] have shown that the spores of anthrax are highly resistant to gentian violet. Death of the mice in Churchman's experiments was probably due, as he suggests, to the spores resisting the action of the dye. It is obvious that destroying the organisms in a test-tube is quite different from destroying them in the circulating blood. There are no spores in the blood stream, but the dye is in weaker dilution and the blood reduces its bacteriostatic action. The

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resistance of the animal to anthrax is also a factor. The authors here report the results of applying dye therapy in the treatment of sheep suffering with anthrax septicemia.

Anthrax appeared among the dairy cattle on a local farm in February, 1925. On February 23, 1925, a band of 70 sheep was vaccinated with anthrax spore vaccine by the simultaneous method. On the morning of March 2, one of these sheep, apparently normal the evening before, was found dead of anthrax. During the following ten days seven more of the sheep were found dead of anthrax. The progress of the disease in these sheep was rapid, the majority dying before the herdsman noticed any evidence of illness. Eleven more sheep became infected and all were injected intravenously with a methyl violet or neutral acriflavine solution.

The first three sheep treated were in a serious condition, being more or less prostrate and discharging a bloody exudate. Judging from the appearance of these sheep, and the rapid death of the eight sheep that had died, these sheep untreated would have died in less than 24 hours. Each sheep was given 7 mg. per kilo (2.2 lbs.) of body weight of methyl violet in a 1 per cent aqueous solution. One sheep died in 36 hours. The other two received two further injections, 40 hours apart, and made rapid and uneventful recoveries. Of the eight other sheep treated four received injections of methyl violet and four injections of neutral acriflavine. All recovered.

The evidence of the value of the dyes in the treatment of anthrax septicemia, as presented by this series of cases, is suggestive rather than conclusive. The development of immunity as the result of the vaccination is an interfering factor. However, the results obtained are worthy of record and justify further clinical application. Experimental work on this subject will be carried on by the authors during the year.

We recommend the following procedure in the preparation and injection of the dyes: Make up a 1 per cent solution, 1 gram of dye per 100 cc of distilled or tap water. Saline solution can be used with neutral acriflavine but not with the violet dyes. Tap water is better than distilled water because it is more alkaline. Add the dye to the water, which has previously been warmed to body temperature, shake vigorously for ten minutes, filter through filter paper, and inject immediately at body temperature. The dye should be injected slowly over a period of 10-15 minutes. The value of aqueous solutions put out by

supply houses has not been determined. Gentian violet and methyl violet solutions, prepared in saline or alkaline water, break down rapidly but, if prepared with distilled water, keep for months. Acriflavine is more stable in a saline solution than is gentian violet. We do not know how long it will retain its bactericidal action in the different solvents. On account of the changes that may occur in dye solutions upon standing, we recommend that all solutions be freshly prepared.

We used a methyl violet manufactured by the National Aniline & Chemical Company for the Gram stain and a neutral acriflavine produced by the Abbott Laboratories. As manufactured by the producers, gentian violet is either a methyl violet, a crystal violet or a mixture of the two. These three dyes have approximately equal bactericidal action. However, since the manufacturers especially prepare a gentian violet (gentian violet medicinal) for intravenous use, we recommend that it be used in place of the dyes prepared for the Gram stain. Different grades of acriflavine are available. The choice should lie with those labeled for intravenous use. Whether these are more bactericidal or less toxic to the animal has not been determined. Since the results obtained may vary with the dye used and the method of its preparation, it is advisable that only standard dyes be used and these prepared fresh as outlined.

The maximum dose at any one injection is 7 mg. per kilo of body weight. Larger doses have been given, both clinically and experimentally, in the treatment of other types of infections with variable results. Our own experiments indicate that unless the solution is made alkaline, 7 mg. per kilo is the largest dose that should be given, particularly if the dose is to be repeated. Normal animals resist this dose repeated on two or three successive days. However, it is advisable, if repetition of the dose is necessary, to give it every 48 hours, rather than at 24-hour intervals. If smaller doses are given they can be repeated oftener. The amount of a 1 per cent solution to be used with each animal is readily determined by simple calculation on the basis that 23 cc of a 1 per cent solution per 100 pounds of animal weight gives 5 mg. per kilo of body weight and 34 cc of a 1 per cent solution per 100 pounds gives approximately 7 mg. per kilo of body weight.

Care should be taken not to allow acriflavine to get into the subcutaneous tissues, as it may cause a permanent edema or necrosis. The violet dyes are less toxic to the subcutaneous

tissues. Since they are supposed to be more effective for Gram-positive organisms, we recommend their use in anthrax infection in preference to the acriflavine.

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RECURRENCE OF TETANUS

Dr. A Dean, of Chicago, reports an interesting case of the recurrence of tetanus in a horse.

Nine months ago Dr. Dean treated an eight-year-old work horse, suffering from a severe attack of tetanus, the infection having gained entrance through a wound in the foot. The horse was given large doses of tetanus antitoxin, a total of 60,000 units. For four days the animal was unable to eat. The horse was kept in slings three weeks and made a good recovery.

Nine months later Dr. Dean was called to treat the same case and found the animal again suffering from a typical attack of tetanus. At present writing the animal can eat a little and drink slowly. There is no visible wound through which infection might have entered the animal's system.

The writer does not recall a case of the recurrence of equine tetanus having been reported in veterinary literature. It is possible that in this case the administration of large doses of tetanus antitoxin established a temporary immunity before antitoxins were formed by the body cells, and that when the temporary immunity disappeared the animal was susceptible to reinfection by the tetanus bacillus.

N. S. M.

BOVINE OBSTINACY

Just what a cow finds to eat on a paved highway is more than the average motorist can figure out, but still the cows persist in taking up the center of the road just for the sake of hearing the horns blow for them to step aside, it would seem.

(Joliet, Ill., *Herald-News*.)

CRUEL

"Rid Your Dog of Fleas," says an advertisment.

"What, and deprive him of his mission in life?" asks a fond dog-owner.

ABSTRACTS

TRANFORGIFTNINGER HOS KALVER (Cod-Liver Oil Poisoning in Calves). L. Slagsvold. Norsk Veterinaer-Tidsskrift, Oslo, vi (1925), pp. 161-168.

Several field cases and one experimentally produced case of cod-liver oil poisoning in calves are described. Brief mention is also made of some work done by Prof. Dr. Erik Agduhr in Sweden on cod-liver-oil poisoning. It is rather interesting to note that rodents thrived on oil that killed calves.

Symptoms: Stiffness, listlessness, tremors, loss of appetite, increased respiration and heart action, desire for lying down, convulsions (at times), dryness of skin, drooling or frothing at the mouth, tenacious feces, urine sometimes brownish or reddish but clear, slightly elevated temperature, tenderness of muscles in certain areas, cyanosis and death in a few hours or days. In the experimental case, cod-liver oil was given May 9 and the animal showed the first symptoms of disease May 25. Death took place in the evening of May 26.

Lesions: Degeneration of certain muscles of the limbs. These muscles are grayish or yellowish white. Slight serous exudate around muscles, small hemorrhages in the epicardium, serous exudate in pericardium, heart muscles pale and waxy in appearance, catarrhal changes in mucous membrane of intestines, liver enlarged, contents of bladder reddish, reddish serous exudate in lungs and thoracic cavity, bronchial and mediastinal glands edematous slight yellowish exudate in subcutis ventrally on the neck, chest and abdomen; spleen congested, kidneys congested and enlarged.

A warning is issued to those who think of cod-liver oil as a "cure-all" and the possibility is suggested that the basal ration may play some part in this trouble.

H. J. S.

SERODIAGNOSTISKE UNDERSÖKELSER VEDÖRRENDE HESTENS INFEKTIÖSE ANAEMI (Serological Investigations on Infectious Anemia of the Horse). L. Slagsvold. Norsk Veterinaer-Tidsskrift, Oslo, iii (1925), pp. 65-73.

These investigations were conducted to see if the test suggested by Abderhalden might be of value in diagnosing swamp fever. Abderhalden and his co-workers claimed that serum from horses

affected with infectious anemia would inhibit the hemolytic power of saponin. After careful investigations and improvement of the technic, Slagsvold concludes that sera from swamp fever patients do not differ sufficiently from sera from normal horses in their effect on the hemolytic action of saponin to warrant the use of this test in the diagnosis of infectious anemia.

H. J. S.

FORSIKRING MOT TAP VED MUND—OG KLOVESYKE (Insurance against Loss from Foot-and-Mouth Disease). W. Juul. Norsk Veterinaer-Tidsskrift, Oslo, ii (1925), pp. 58-61.

The author, who is evidently a director of an insurance company, presents plans and reasons for insurance against foot-and-mouth disease. A note by the editor of Norsk Veterinaer-Tidsskrift follows, calling attention to the fact that the fear of losses from foot-and-mouth disease on the part of the farmers has been an aid in keeping the country free from this dreaded plague. He feels that by introducing insurance this fear will materially vanish and hence more will be lost than gained thereby.

H. J. S.

DEN SMITSOMME ANAEMI HOS HESTEN (Infectious Anemia in the Horse). H. Horne. Norsk Veterinaer-Tidsskrift, Oslo (Kristiania), ix (1924), pp. 257-261.

The author gives an account of the occurrence and method of controlling infectious anemia of the horse in Norway, the disease having been discussed in a series of articles appearing in the same journal. Reference is also made to the distribution of this disease in Sweden.

H. J. S.

O. S. U. ALUMNI AT PORTLAND

Twelve alumni of the College of Veterinary Medicine, Ohio State University, attending the sixty-second annual meeting of the A. V. M. A., together with the wives of six of the members, met at the Multnomah Hotel, Portland, Oregon, on the evening of July 22, 1925.

After dinner had been served, Dr. H. J. Hammond, of Sacramento, California, who acted as toastmaster, presented a "sheep-skin," suitably inscribed, to Dr. D. S. White, this sheep-skin being one taken from a pure-bred ram owned by Dr. Hammond.

BIBLIOGRAPHY ON BOVINE INFECTIOUS ABORTION FOR 1924.

Note. An effort has been made for the past several years to bring together all the references to literature on bovine infectious abortion so that research men and others may have them available at all times in a convenient form.

The favorable comments on this effort have stimulated us to continue submitting the bibliography to the JOURNAL of The American Veterinary Medical Association. Omissions and corrections should be brought to the attention of the undersigned.

Michigan State College,
East Lansing, Michigan.

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HAVE YOU PAID YOUR DUES?

For the benefit of those members who do not fully understand the change made, this year, in the payment of dues, we are pleased to explain the matter again.

Heretofore, the year covered by the annual dues started on September 1 and ended the following August 31. Now, our year corresponds with the calendar year and begins January 1. The amount of the dues remains the same—$5.00 per year.

If your membership card bears a year-date "1924," your dues were paid up to September 1, 1925, and unless you have sent a remittance for dues within the past week or so, you owe for the balance of 1925 (four months), or $1.67, as well as for the year 1926, or $6.67 in all. The dues for 1926 became payable November 1.

If you hold a membership card bearing a year-date "1925," your dues are paid up to January 1, 1926, and unless you have just recently forwarded your dues for 1926, you owe $5.00.

If you have received your membership card for 1926 (approximately six hundred members have), your dues are paid up to January 1, 1927, and therefore you owe nothing at present.

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

Regular Army

Major Robert J. Foster, Fort Riley, Kansas, promoted to rank of lieutenant-colonel, effective August 30, 1925.

Major George A. Hanvey, Fort Ethan Allen, Vermont, promoted to rank of lieutenant-colonel, effective September 6, 1925.

Captain George H. Koon, Carlisle Barracks, Pa., promoted to rank of major, effective September 27, 1925.

Captain Ralph M. Buffington, Fort Sam Houston, Texas, promoted to rank of major, effective September 29, 1925.

Captain Daniel B. Leininger, Camp Marfa, Texas, promoted to rank of major, effective September 29, 1925.

Captain Daniel H. Mallan, relieved from assignment and duty with veterinary detachment, Fort Riley, Kansas, and assigned as student at The Cavalry School, September 13, 1925.

Veterinary Reserve Corps

Additional Reserve Officers

Majors:
- Allen, Leslie J. ..... 5133 Birchman Ave., Ft. Worth, Tex.
- Cheely, Edward I. ..... Box 153, Milwaukee, Oregon.

Captains:
- Krubsack, Grover Wm. ... 48 N. Clinton Avenue, Clintonville, Wisconsin.
- Topmiller, Alex Charles .. Murfreesboro, Tenn.

First Lieutenants:
- George, Frank H. ..... Plain City, Ohio.
- Stott, Lewis Niles ..... 420 Delaware Avenue, N. E., Mason City, Iowa.

Second Lieutenants:
- Davis, Ennis Augustus ... 47 W. Cain Street, Atlanta, Ga.
- Bogue, Joseph Alvin ..... Lawrence, Kansas.
- Foster, Robert Sanderson. 825 Williams Avenue, Portland, Oregon.
- Miller, Norman Duman .. 310 N. 11th Street, Muskogee, Okla.
- Nevitt, John Victor ..... Box 282, Wichita, Kansas.
- Moburg, Edwin Russell... 410 W. Walnut Street, Salina, Kansas.

OUR CHICKEN WEALTH

The chicken population of the United States is about half a billion, or something like five chickens for each man, woman and child, and the population is increasing rapidly in the poultry world, to the advantage of the country. The annual output of eggs last year amounted to more than $600,000,000, while the poultry sent to market for food was worth half a billion dollars, and the value of the live poultry held in reserve on the American farms was about $400,000,000, the chickens being wonderful producers of wealth.—(*Ohio State Journal.*)

It is estimated that twenty cents out of every dollar that the American family spends for food goes for dairy products—milk, butter, cheese and ice cream.

ASSOCIATION MEETINGS

MISSOURI VALLEY VETERINARY ASSOCIATION

The 1925 convention of the Missouri Valley Veterinary Association was held at the Elks' Club, Omaha, Nebr., July 13-14-15. It was considered a fine meeting by all those who attended, full of old-time enthusiasm in the interesting discussions presented before the Association. There is no doubt left in the minds of those who took in this meeting that this Association has a place —to bring together the veterinarians of this territory to discuss their mutual problems.

Due to internal troubles a few years ago, the question of disbanding came up, and that feeling got pretty well disseminated throughout the membership, which at one time numbered over seven hundred, making it next in size to the A. V. M. A. With the large private schools, which turned out several hundred graduates a year, now closed, the opportunities to increase the membership back to its former position can not be expected; yet within easy traveling distance of the meeting places of the Association, approximately one thousand veterinarians are located. Among the active workers in the Association are the men who do things in their respective state associations, men who reside in western Iowa, eastern Nebraska, northern Missouri and eastern Kansas, although many are members and regular attendants who live in other parts of these states, and in states adjoining them.

Until a few years ago, there was some criticism that the Association detracted from the state associations and from the American Veterinary Medical Association, by holding competitive programs about the same time of the year, with some veterinarians feeling that they could not attend both meetings. This criticism has been met by changing the constitution and by-laws so that there is now only one meeting a year, which is held in the summer. All the state associations in this territory hold their meetings in the winter. In the case of the A. V. M. A. meeting in this territory, the Missouri Valley Veterinary Association does not hold a summer meeting, but holds a winter meeting, according to the change in the by-laws. One of the requirements of membership is that the applicant must belong to the state association of the state in which he resides. So far as the

Association hurting the A. V. M. A. meetings now, this is negligible, for very few general practitioners attend the A. V. M. A. meetings regularly, but only when the A. V. M. A. meets in their territory.

The Association affords the veterinarians of the Missouri Valley an opportunity to get together, renew old friendships, discuss their problems as met in the various states, and to confer on the handling of diseases common to this territory. This privilege of renewing old acquaintances is especially appreciated by graduates of the extinct private schools who, except for the A. V. M. A. meetings at intervals of several years apart, have little chance to meet, while the alumni of the state colleges can do so each year. With this year's meeting highly successful, many old members renewed their membership and thus put the Association in good financial shape, with a membership of approximately three hundred.

The first day's program opened with an address by President G. P. Statter, who stressed the need for closer cooperation among practitioners and other veterinary forces, renewed interest in the Association, and for assistance in making the meetings what we all want them to be—worthy of our time and expense in attending them. Two papers on the handling of minerals by veterinarians were presented—one by Dr. B. W. Conrad, of Sabetha, Kansas, and the other by Dr. F. O. Lundberg, of Wausa, Nebr. These papers brought out a lively discussion of both sides of this activity, which is attracting the attention of the profession at this time. The general opinion prevailed, however, that to enter this field with purely commercial aims should not be encouraged, for it would bring the profession to the level of the peddlers; but the prescribing of minerals to correct deficiency diseases was considered a legitimate field of the veterinarian.

Next followed a very good presentation of the subject, "The Status of the Spayed Heifer," by Dr. W. H. Bailey, of St. Joseph. In the discussion that followed, the report was made that, in an experiment at the University of Nebraska, the spayed heifers had not done better than the open heifers, but this view was not shared by the practitioners, from their observations under usual farm or range conditions. The spaying of the milk cow to enhance the quality of the milk, and to lengthen the lactation period to several years, was brought out, as well as the spaying of cows having milk fever regularly.

In the afternoon, the Secretary read a very interesting paper by Dr. A. Eichhorn, entitled, "New Phases in the Control of Anthrax Through Vaccination." Dr. W. S. Gochenour, of Washington, D. C., addressed the Association on the subject of "Hemorrhagic Septicemia." He answered numerous questions on this topic which is so vital to this great feeding section of the United States. His discussion was highly appreciated.

The motion picture, "Suppressing Foot-and-Mouth Disease," from the U. S. Department of Agriculture, was then shown, which was followed by some views which were personally prepared by Dr. G. E. Golden, of Sioux City, Iowa. In the evening, the veterinarians went in a body to the Aksarben, a feature which is nationally known for the good times afforded at this comedy, which is given under the auspices of the Commercial Club of Omaha, for visitors to the city.

The second morning the program started with a thorough discussion, by representatives from the various states of the Missouri Valley, upon the tuberculosis eradication movement, and how the plans were being worked out. In all the states in which the county area work is going on, practitioners are being used. Nebraska had used thirty-eight practitioners and Iowa two hundred and two, in the forty-six counties working under this plan, which is on the per diem basis. In Kansas, the practitioners test on the per head basis, at the same rate at which the work is done by full-time government veterinarians.

"Live Stock Sanitation" was next presented by Dr. C. H. Hays, state veterinarian of Nebraska. He discussed some matters which he wished to convey to the practitioners about state work, in a very forceful and clear manner. "Experiences with European Fowl Pest" was the topic of a discourse by Dr. E. L. Stubbs, of the Pennsylvania Bureau of Animal Industry, who described the outbreaks he encountered, and presented a very vivid picture of the condition as he saw it.

In the afternoon the election of officers was held with the following results: President, Dr. B. W. Conrad, Sabetha, Kansas; vice-president, Dr. R. C. Foulk, Holton, Kansas; secretary-treasurer, Dr. E. R. Steel, Grundy Center, Iowa; members of Executive Board, Dr. C. E. Baxter, for Iowa; Dr. I. W. McEakran, for Nebraska; Dr. J. W. Chenoweth, for Missouri; Dr. A. F. Wempe, for Kansas; Dr. T. W. Gidley, member-at-large.

Dr. J. N. Frost, Professor of Surgery, Cornell University, conducted a question box on dairy cattle practice. This brought out many points of interest and proved highly instructive. Among the questions discussed were the use of formalin in mastitis, bacterins in streptococcic mastitis, antiseptic oils in cows' uteri when hard to remove placenta, treatment of sterility, use of gland extracts, etc. Dr. Frost advises that if formalin is used, it should be given well diluted, and when the cow has drunk water, using it in ounce doses once or more times a day. He also recommended turpentine in ounce doses, well diluted, for its

DR. B. W. CONRAD

elimination through the udder. He reported that in some cases he had found streptococcus bacterins of value in preventing the spread through the herd. Antiseptic mineral oil injected into the uterus daily, in cows difficult to clean, was recommended. The practitioners had an opportunity to bring out all the problems of dairy cattle practice, and the question box proved to be exceedingly interesting.

"Some Problems of the Profession" was the topic of "the best darned speech he ever heard Dr. L. A. Merillat make," according to the president of the Nebraska Association. Anyhow, he really warmed up to the occasion, and discussed the problems

of the profession as he had met them as president of the American Veterinary Medical Association. This was followed by a splendid paper on "Publicity for the Veterinary Profession," by Dean R. R. Dykstra, of the Kansas State Agricultural College. This paper was discussed by Dr. C. J. Norden, president of the Nebraska State Association and Dr. C. J. Scott, president of the Iowa Veterinary Association, who presented their plans for publicity of the profession in their states.

A banquet was held at night with 120 veterinarians present with their families and friends. Dr. J. I. Gibson led the community singing, which was followed by several solos. Dr. R. R. Dykstra made a speech on "Veterinary Education and the Live Stock Industry." Dr. E. A. Cahill gave an illustrated address on "Veterinary Conditions in South America," which was certainly entertaining and instructive. Dancing was then enjoyed for the remainder of the evening.

On the third day of the meeting a clinic was held at the stockyards, with 250 in attendance. First, Dr. H. B. Treman demonstrated his methods of restraint for operating on horses in the standing position. Dr. J. W. Chenoweth spayed a heifer. Dr. E. L. Stubbs demonstrated a postmortem on a fowl, pointing out the location of lesions to be looked for in diagnosing various conditions, including fowl pest. Finally, Dr. Frost demonstrated conditions met with in handling sterility in cattle by means of specimens which were collected from the packing-houses. He also performed various operations on the udder, using some udders from the killing floor, presented for the occasion and showed how he does the operation for end-to-end anastomosis of the intestine, in cases of intussusception, with almost 100 per cent recoveries. In discussing the operation on the cow's tongue to prevent sucking, Dr. Frost stated that he uses hog rings inserted in the tongue for this.

With a vote of thanks to those who had contributed to the program, the meeting adjourned.

E. R. STEEL, *Secretary.*

HAWAII VETERINARY MEDICAL ASSOCIATION

The second annual meeting of the Hawaii Veterinary Medical Association was held at the rooms of the Board of Commissioners of Agriculture and Forestry, Sept. 7, 1925. The following program was carried out:

DEMONSTRATIONS

Tuberculosis reactors. Lesions demonstrated. Drs. T. F. Arnold and L. E. Case.

Dressed beef grading. Col. Wm. A. Sproule and Capt. Stanley C. Smock.

PAPERS

"Meat Inspection," by Dr. T. F. Arnold.

"Notes on Field Observations Made on a Disease Resembling Pestis Equinus, "by Dr. J. C. Fitzgerald.

"Dairy Sanitation," by Dr. L. C. Moss.

"Some Observations on Blackleg and Its Control on Maui," by Dr. V. N. Onissimenko.

"Tuberculosis Eradication on Oahu," by Dr. L. E. Case.

The president's address was presented by Dr. H. B. Elliot.

At 2:00 p. m., the members took an auto trip, visiting and inspecting the new Hind-Clarke certified dairy.

In the evening, a banquet was served at the Young Hotel. Dr. P. H. Browning addressed the members, reporting on his trip to the mainland, and the convention of the American Veterinary Medical Association, held at Portland, Oregon, July 21-25, 1925. Col. Wm. A. Sproule also spoke, his topic being "The Army Veterinarian."

Visitors present at the banquet who made interesting talks were: Mayor John H. Wilson, of Honolulu; Mr. H. P. Agee, Director of the Sugar Planters' Experiment Station and member of the Board of Commissioners of Agriculture and Forestry; and Mr. F. C. Giltner, of the firm of Giltner Bros., of Eminence, Ky., exporters of live stock, who have exported to the territory of Hawaii many thousands of dollars' worth of live stock, and who came to judge the live stock at the Territorial Fair, August 31 to September 9.

The officers elected for the ensuing year were: President, Dr. H. B. Elliot, Hilo; vice-president, Dr. J. C. Fitzgerald, Paia, Maui; secretary-treasurer, Dr. P. H. Browning, Honolulu.

It was voted to hold the next annual meeting at Hilo.

P. H. Browning, *Secretary.*

AMERICAN ASSOCIATION OF INSTRUCTORS AND INVESTIGATORS IN POULTRY HUSBANDRY

The seventeenth annual meeting of the American Association of Instructors and Investigators in Poultry Husbandry was held at the Kansas State Agricultural College, Manhattan, Kansas, July 10-15, 1925. Dr. B. F. Kaupp, a veterinarian, who is head of the Poultry Pathological Laboratories, Poultry Department, North Carolina State College, and one of the pioneer workers in

poultry disease investigation, was president of this Association for the past year.

To the veterinarians who were privileged to attend this meeting, it was inspiring to observe the keen interest and enthusiasm displayed by those who are doing the basic work in the development of the poultry industry, as they presented their program of over thirty papers, comprising a variety of poultry subjects. Committee reports were also presented. Dr. C. H. Weaver, a veterinarian of Canada, is chairman of the Committee on Diseases of this organization. Dr. F. R. Beaudette and Dr. W. R. Hinshaw were other veterinarians who appeared on the program, giving articles on poultry diseases.

The first two days were devoted to a discussion of plans, rules, and regulations for standardizing flocks, hatcheries, and eggs, concerning type, production, and freedom from white diarrhea. This work is growing very rapidly, especially the white diarrhea work, and is something about which veterinarians should become informed.

Some very good work was reported at this meeting on the effect of ultraviolet light and cod-liver oil on chickens. It was reported that ultraviolet light and cod-liver oil each seemed to supply the necessary antirachitic factor that direct sunlight supplies to hens, as far as the hatchability of eggs and the development of chicks are concerned. However, biological analyses showed that the eggs from hens receiving direct sunshine contained more of the antirachitic factor than eggs from the hens receiving either ultraviolet light from a quartz lamp or 0.5 cc of cod-liver oil per day.

Dr. Ackert, of Kansas, reported that all the known intermediate hosts of poultry tapeworms are flies, and that roundworm eggs have an incubation period of one month in the soil.

The following veterinarians were in attendance: Drs. B. F. Kaupp, North Carolina; Sivert Eriksen, Missouri; Frank Hare, Delaware; F. R. Beaudette, New Jersey; E. L. Stubbs, Pennsylvania; J. W. Connaway, Missouri; W. W. Dimock, Kentucky; E. A. Tunnicliff, Illinois; and W. R. Hinshaw, Kansas. Dean Dykstra and members of the veterinary faculty of the Kansas State Agricultural College were also in attendance.

This Association welcomes veterinarians as members. Those devoting their full time are made active members and those devoting part time, associate members.

"Poultry Science," the official publication of this organization, is furnished free to members, and may be had by subscribers at $3.00 per year. This is a bi-monthly publication and contains the best articles on poultry husbandry, as well as some excellent poultry disease articles.

E. L. STUBBS, *Reporter.*

GEORGIA STATE VETERINARY ASSOCIATION

The nineteenth annual meeting of the Georgia State Veterinary Association passed into history at Brunswick, September 7-8-9, 1925. For an enjoyable meeting, it will be hard to beat. In spite of the extreme drought that has prevailed over the greater part of Georgia, there was a remarkably large attendance. The papers were good, and brought out much interesting discussion. Informal case reports and discussions were numerous.

The meeting was presided over by Dr. J. E. Severin, and was opened by an address of welcome by Fred G. Warde, manager of the Brunswick Board of Trade. This was also a historical review of those points of interest which had great bearing on the development of Georgia and the whole United States, from the time when this section was first settled by Oglethorpe and his English colony, through their wars with the Spanish and the Indians for possession of the Southeast, to the present day. In this talk, the history of the Battle of Bloody Marsh, where Oglethorpe fought the Indians, Fort Frederica, the oldest fort in America, and Wesley Oak, under which the Methodist Church was organized by John Wesley, were refreshed in the memories of Mr. Warde's listeners. It was an interesting talk, and a genuine welcome, and was responded to by Dr. A. L. Hirleman, of Atlanta.

The second day of the meeting was given over to a boat trip of fifty miles, to the city of Fernandina, Florida, on Amelia Island. All members present, together with the ladies, left Brunswick on the little steamer "Emmaline," for that interesting little island of Florida. Refreshments consisting of so-called beer, pretzels, shrimp and bottled soft drinks were on board and well attended.

This was a very interesting as well as instructive trip. The route taken passed many notable islands, among which was Jekyl Island, where a group of Northern men have their winter hunting preserves. Big Cumberland Island, which is in possession of the Carnegie Estates, was seen on this inland route. On Big Cumberland were seen the four large homes of the Carnegie

families. Of these, "Dungeness" is probably the largest. The immense castle, of about two hundred rooms, on this estate, was once the home of the widow of the late Andrew Carnegie, and she now lies buried near this castle.

Large fleets of prawn or shrimp and pogy boats were seen in the waters around Amelia Island.

We reached Fernandina about 12:30 o'clock and were met at the wharf by the Fernandina Automobile Club. These gentlemen carried us to the Keystone Hotel, where a splendid lunch, given by the Fernandina Chamber of Commerce and the Hotel management, was served. After lunch, the Automobile Club again took us in charge and showed us the wonderful sights on Amelia Island. And I might say, in passing, that not once did these men broach the subject of buying real estate on the Island. Their's was a genuine hispitality that would naturally reap its own reward. This island is only about eighteen miles long by two miles wide. We were carried over Amelia Beach, which is about eighteen miles in length, and as fine as can be found on the Coast. During low tide it can be traversed almost its entire length by automobile.

The boat was again boarded about 4:00 o'clock, and an interesting return trip begun. This trip was made more interesting to all, and exciting to many, by the fact that, due to low tide, darkness and the narrow channel through Jekyl Creek, the boat ran aground in the shallow water. Here we were at the mercy of the wind and the waves for nearly two hours. The tide finally came to our rescue and we were landed at Brunswick at about 11:00.

The next day all business was settled and the time spent in various ways. Some went sight-seeing, some surf bathing—and later applying cold cream—and still others tried sea fishing. All that Dr. W. E. White, of Tifton, caught on his line was his finger. He had to submit to an operation to have the hook removed.

At the business meeting a resolution was adopted protesting against the indiscriminate distribution of veterinary biologics and supplies by laboratories and supply-houses and their distributors.

WHEREAS, It has been brought to the attention of the Georgia State Veterinary Association, in regular session assembled, that a number of veterinary supply houses are selling biologics and other veterinary supplies directly and indirectly to live stock owners, through distributors, and

WHEREAS, We do not consider such practice ethical to the veterinary profession, nor advantageous to a safe live stock development, therefore, be it

Resolved, That this body protest against the continuance of such practice, and, should such practice be continued, the confidence in, and further support of such supply-houses, by the members of this Association, will necessarily be disrupted.

A resolution also was adopted, protesting against county farm demonstration agents for failing to give credit, in their reports, to veterinarians who perform services, such as vaccination of hogs and tuberculin testing of cattle, when such work is merely arranged by the agents.

WHEREAS, The published reports of county agents' activities indicate that some county agents are extensively engaged in hog cholera control work, a service for which they are not prepared nor qualified, and

WHEREAS, Live stock sanitary control is essentially a veterinary problem, and

WHEREAS, The laws of the state of Georgia provide that only those who have secured licenses from the Georgia State Board of Veterinary Examiners are legally authorized to practice veterinary medicine and surgery in the state of Georgia, therefore, be it

Resolved, By the Georgia State Veterinary Association, in regular annual session assembled, that the practice of veterinary medicine or surgery, in any of its branches, by county agents is unfair, unjustifiable and illegal. The Secretary is hereby instructed to present this protest to Director J. Phil. Campbell and to urge the authorities in charge of county agents to restrict their activities to the many useful and necessary services for which they are especially qualified.

The out-of-state members who attended were: Drs. T. H. Applewhite, acting inspector-in-charge of tick eradication in Georgia and Florida, and H. V. Porter, assistant state veterinarian of Florida. Dr. J. V. Knapp, state veterinarian of Florida, was elected an honorary member of the Association.

Dr. A. G. G. Richardson, dean of the Veterinary Division at the State College of Agriculture, was recommended for reappointment on the Georgia State Board of Veterinary Examiners for a period of five years.

The officers elected for the coming year are: President, Dr. W. E. White, Tifton; vice-president, Dr. R. M. Walsh, Atlanta; secretary-treasurer, Dr. Peter F. Bahnsen, Americus.

The next meeting of the Association will be held in Atlanta during the month of September 1926.

PETER F. BAHNSEN, *Secretary*.

WESTERN STATES LIVESTOCK SANITARY ASSOCIATION

The second meeting of the Western States Livestock Sanitary Association was called to order by the president, Dr. W. J. Butler, of Helena, Montana, at the Multnomah Hotel, Portland, Oregon, July 20, 1925.

A very splendid address of welcome was delivered by Colonel Faville, of Portland, Oregon. The roll-call divulged the fact that there were twenty members present, representing their respective states, not including the new members who attended the meeting.

The President's report was read in full by Dr. W. J. Butler, state veterinarian of Montana. A few of the important paragraphs, taken from Dr. Butler's report, set forth the ideas and objects of the Association:

"The Western States Livestock Sanitary Association was conceived in a spirit of unselfishness. It is the outcome of a persistent and strong desire upon the part of live stock sanitary officials and live stock growers for uniform regulations and methods of governing the interstate movement of live stock, and controlling and eradicating live stock diseases within our respective states.

"We believe in every reasonable sanitary precaution and the right of each individual state to exercise every reasonable precaution to protect its live stock industry.

"Health control must begin with live stock sanitation.

"To have quick results, uniform, practical and broadside laws and regulations should be promulgated from all states alike.

"The public, therefore, should strongly back the good intentions and work of live stock sanitary organizations."

The Secretary-Treasurer's report was read by Dr. W. R. Smith, state veterinarian of Idaho. The Executive Committee's report was read by Dr. Edward Records, of Nevada, who is chairman of this committee.

The work of this committee, for the past year, has consisted almost entirely of an effort to draft, and have adopted by the U. S. Live Stock Sanitary Association and the U. S. Bureau of Animal Industry, regulations governing the creation of modified tuberculosis-free accredited areas, better adapted to the needs of the western states, than those previously in effect.

Resolutions have been worked out by the chairman of the Executive Committee since this meeting, and have been submitted to the Secretary. These read as follows:

WHEREAS, The eradication of tuberculosis in those states having a large percentage of open range land presents certain problems not found in more thickly settled states where all lands are under fence, and

WHEREAS, The present regulations governing the creation of modified tuberculosis-free accredited areas are not fully adapted to conditions in the range states, and

WHEREAS, A change in these regulations can apparently be secured only after the Committee on Tuberculosis of the U. S. Live Stock Sanitary Association and the membership of that Association are fully familiarized with the facts, now then be it

Resolved, That the Western States Livestock Sanitary Association respectfully urge that the Committee on Tuberculosis of the U. S. Live Stock Sanitary Association arrange to have some member of this Association appear on the program at the 1925 meeting of the U. S. Live Stock Sanitary Association, and present a paper setting forth the needs of the range states in this connection, and that at the first opportunity, the Committee on Tuberculosis of the U. S. Live Stock Sanitary Association be enlarged to include a member from one of the range states.

WHEREAS, It is the belief of the members of this Association that the interest of beef producers in modified tuberculosis-free accredited areas would be directly stimulated thereby, and

WHEREAS, We believe the slaughterers of beef would be benefited by a known tuberculosis-free source of supply, now therefore be it

Resolved, That the officers of this Association be instructed to take up with the American Institute of Meat Packers, through whatever channel they deem best, the paying of a small bonus for cattle produced and finished entirely within modified tuberculosis-free accredited areas, and urge favorable action in this connection.

These resolutions have been submitted by the Secretary to the chairman of the Committee on Tuberculosis of the U. S. Live Stock Sanitary Association, Dr. M. Jacob, and it is hoped some action will be taken upon same.

Lengthy discussions by various members on the interstate shipments of dairy cattle for immediate slaughter finished the morning session of the meeting.

The meeting was again called to order at 1:30 p. m. A very interesting and educational address on "The Economic Changes Causing Distress Among Farmers and Live Stock Men," was delivered by A. W. B. Kjosness, Idaho's Commissioner of Agriculture.

Dr. J. R. Mohler read a paper entitled, "Dangerous Microbian Immigrants." (This paper was published in full in the September issue of the JOURNAL.)

Dr. Mohler was followed by Dr. Rudolph Snyder, B. A. I. inspector-in-charge, Sacramento, Calif., who drew a very vivid picture of the methods of controlling and eradicating the dreaded foot-and-mouth disease in California, together with various obstacles placed in the inspector's path which might have a tendency to retard the work. The members were very grateful to Dr. Snyder for the information divulged.

Dr. Charles G. Lamb, state veterinarian of Colorado, presented a very complete and practical paper on "Regulations Relative to Accredited Herds, Accredited Areas and Tuberculin Testing." A special committee was appointed to draw up resolutions to be submitted to the next meeting of the U. S. Live Stock Sanitary Association.

Dr. W. H. Lytle, state veterinarian of Oregon, read an excellent paper on "Sheep Scab and Its Methods of Control and Eradication in the Western States."

Dr. J. P. Iverson, state veterinarian of California, delivered an excellent paper on "Uniform Regulations," which dealt extensively on the necessity and advisability of the western states adopting uniform regulations relative to quarantines and quarantine enforcement. A lengthy and interesting discussion

was held. The President instructed Dr. Iverson to draw up regulations covering this matter.

Dr. W. F. Crewe, state veterinarian of North Dakota, presented copies of proposed uniform regulations. Additional copies are ready for distribution upon request to the Secretary. The special Committee on Tuberculin Testing, with Dr. Records as chairman, presented the following:

> WHEREAS, Uniform regulations governing the interstate movement of live stock will be of great benefit to shippers and state live stock sanitary officials, now therefore be it
>
> *Resolved*, That we recommend the proposed regulations presented at this meeting by Dr. Crewe to the careful consideration of state live stock sanitary officials, and the adoption of a similar form by the several states in so far as possible.

A very interesting paper was read by Dr. P. H. Browning, territorial veterinarian of Hawaii, which was prepared by Dr. J. C. Fitzgerald, one of his field inspectors, the subject being, "Notes on Field Observations Made on a Disease Resembling Pestis Equinus." This condition has prevailed in Hawaii for some years, and has not been investigated until a few months ago.

Dr. Charles G. Lamb, chairman of the special Committee on Accredited Areas, Accredited Herds, and Tuberculin Testing, reported that the advisability of changing the rules and regulations covering this matter should be taken up with the U. S. Live Stock Sanitary Association, through the regular channels, and their decision should be final. This question was argued in general sessions, and the final concensus of opinion was that the present regulations should continue to be effective, and no further regulations made until the next meeting of the U. S. Live Stock Sanitary Association, in Chicago, in December.

The officers for the ensuing year were elected as follows: President, Dr. J. P. Iverson, Sacramento, Calif.; 1st vice-president, Dr. C. G. Lamb, Denver, Colo.; 2nd vice-president, Dr. N. F. Williams, Fort Worth, Tex.; secretary-treasurer (re-elected), Dr. W. R. Smith, Boise, Idaho. The Executive Committee, with Dr. Edward Records as chairman, was retained.

The meeting adjourned until such a time as a special meeting should be called by either the President or Executive Board, or until the yearly meeting.

A banquet was held the same evening in the Multnomah Hotel, at 7:30 p. m., and was unanimously attended by all members. Mr. O. M. Plummer, secretary and general manager of the Pacific International Live Stock Exposition, was toast-

master, with Dr. J. R. Mohler, chief of the U. S. Bureau of Animal Industry, as the principal speaker of the evening. A very enjoyable time was reported by all.

W. R. SMITH, *Secretary.*

BRITISH COLUMBIA VETERINARY ASSOCIATION

The eighteenth annual meeting of the British Columbia Veterinary Association was held September 11, 1925, at the Hotel Russell, New Westminster, B. C. The president, Dr. J. G. Jervis, was in the chair and there was a good showing of members. Professor P. A. Boving, of the University of British Columbia, gave a very fine address on "Breeding and the State." In the opinion of the members it was the finest address ever delivered before a meeting of the Association. Both the president and the secretary gave a résumé of the past year's work, and the latter presented the annual balance sheet, showing the Association to be in a fine financial position.

The secretary reported the death of one of the oldest members of the Association, Dr. W. J. Bland, of Vancouver. A wreath of flowers was sent from the Association and several members were present at the funeral. It was brought to the attention of the members that the family was in somewhat straightened circumstances and it was unanimously resolved that the Association donate the sum of $100 to help tide the family over their present embarrassment.

Dr. Jervis and Dr. Gillam gave their impressions of the recent A. V. M. A. meeting held in Portland, both speaking highly of the program, and particularly of the arrangements of the local committee. During the afternoon Dr. L. D. Swenerton presented some interesting case notes regarding a complicated case of intestinal trouble in a horse. Dr. E. A. Bruce gave a very interesting talk on "Poultry Diseases."

Some considerable discussion took place with regard to the employment of laymen in the Meat Inspection Division, a procedure which the majority of the members viewed with considerable disfavor.

The officers elected for the forthcoming year were: President, Dr. J. G. Jervis (re-elected); vice-president, Dr. F. W. Ottewell (re-elected); secretary-treasurer and registrar, Dr. W. Graham Gillam (re-elected); Council, Drs. T. H. Jagger, G. Howell, M.

Sparrow, T. R. R. Hoggan. As Board of Examiners, the Council appointed Drs. W. H. MacKenzie, chairman, Strong and Sparrow.

After a very profitable and enjoyable meeting, the members adjourned to the Provincial Exhibition.

W. GRAHAM GILLIAM, *Secretary.*

INDIANA-ILLINOIS VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Indiana-Illinois Veterinary Medical Association was held at East Side Park, Washington, Indiana, September 18, 1925. Veterinarians in attendance from southeastern Illinois and southwestern Indiana, with their wives, numbered about fifty. A chicken dinner, with all the trimmings, was served at noon, after which the literary program was held.

The meeting was called to order by Dr. W. J. Ridgway, president, who welcomed the members and visitors. Dr. Ridgway then turned the meeting over to Dr. M. W. Scott, who proceeded to act as master of ceremonies for the balance of the afternoon.

Dr. H. Preston Hoskins, secretary-editor of the American Veterinary Medical Association, was called upon for the first address. His subject had been assigned to him as follows: "The Veterinarian. Who is He? What is He? What of His Future?" The speaker expressed great faith in the future of the profession, providing that we keep up the pace that we have started. We must continue to act as the protectors of our great live stock industry, and of the people's health as well. Dr. Hoskins emphasized the importance of the right kind of publicity—not advertising—for the profession, stating that the general public does not know what an important function the veterinarian performs in our economic system, through his daily activities in connection with meat and milk inspection, tuberculosis eradication, and animal disease control, with such plagues as foot-and-mouth disease, Texas fever, and hog cholera.

Dr. Frank R. Bartlow, of Indianapolis, who confines his practice to small animals, gave a splendid talk on canine distemper and hospital management. Dr. Bartlow stated that the dog, although one of the hardest animals to treat, had received less consideration in our text-books than any other animal, and that the veterinarian who succeeds in small animal practice does so only by close application and conscientious effort.

Dr. R. C. Julien, state veterinarian of Indiana, addressed the meeting on matters of interest to the practitioner. He outlined plans for the Lake States Tuberculosis Eradication Conference to be held at Indianapolis, October 12-13, and extended a cordial invitation for every veterinarian to attend and participate in the discussions.

Dr. R. A. Craig, Chief Veterinarian, Purdue University, presented a paper entitled, "Diagnosis of Animal Diseases," in which he emphasized the importance of a correct diagnosis, and urged veterinarians to make use of every facility at their disposal. Dr. Craig stated that his department is now being called upon to make considerably fewer laboratory diagnoses for practicing veterinarians, due to the fact that the members of the profession have become highly proficient in diagnosing diseases, particularly those prevalent among swine.

Dr. Craig went on to state that poultry diseases are worthy of more attention upon the part of veterinarians than members of the profession are giving to this branch. This is borne out by the large number of poultry specimens which are sent into his laboratory for diagnoses. On account of the delays which are occasioned in securing laboratory diagnoses, much valuable time is sometimes lost in applying the proper treatment in flocks where disease has made its appearance. Poultrymen are being advised to consult their veterinarians when they have trouble in their flocks, and veterinarians in turn should be posted on poultry diseases and ready to render the proper services when necessary.

Dr. Scott announced the time and place for the annual meeting and fish-fry, in June next, and urged all to make plans to attend. After giving a vote of thanks to those who participated in the program, the meeting was adjourned.

M. W. Scott, *Secretary.*

NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS—ILLINOIS DIVISION

The members of the National Association of B. A. I. Veterinarians of Chicago were deeply grieved to learn of the passing away of Dr. B. H. Ransom, Chief of the Zoological Division, Washington, D. C., September 17, 1925.

Dr. Ransom, because of his research work in animal parasites, was made an honorary member of our Association and held in the highest esteem by its members.

He was frequently called upon, during his official visits, to address our Association on different parasitic diseases, and when he discussed a subject there was always something new and of value brought out.

We feel our Country has lost one of her most valuable scientists, one whose place it will indeed be difficult to fill, but we must believe that the valuable work that he did will form a basis for greater achievements in the field of parasitology in the future.

While he was called away in the very prime of life, yet we believe that his efforts and work will continue to live on and on and, as someone has said:

"We know not what we shall be, but are sure
The spark once kindled by the eternal breath
Goes not out quite, but somewhere doth endure
In that strange life we blindly christen death.
Somewhere he is, but where we cannot tell.
But wheresoe'er God hides him, it is well."

Therefore, be it

Resolved, That the Country has lost an able and efficient leader in the field of science, and our Association a very valuable member, and be it further

Resolved, That this Association extend to his bereaved wife and parents the sympathy of the entire Association, and that a copy of these resolutions be sent to the bereaved family and the same be spread on our minutes.

W. N. NEIL,
H. B. RAFFENSPERGER,
A. A. SWAIM
Committee.

CONESTOGA VETERINARY CLUB

The regular monthly meeting of the Conestoga Veterinary Club was held in the Medical Rooms of the Stevens House, Lancaster, Pa., October 8, 1925.

Dr. R. S. Amadon, recently appointed professor of veterinary physiology and pharmacology in the University of Pennsylvania Veterinary School, addressed the club on "The Physiology of Small Animals." The lecture was the second of the series being given by the Veterinary Extension School, and was greatly appreciated by the members.

Dr. Harry W. Barnard presided, and with the following members, welcomed Dr. Amadon to Pennsylvania: Drs. C. V. Peace, J. J. Johnson, E. L. Cornman, M. O. Robinson, C. J. Bryer, H. B. Mitchell, B. P. Chodos, E. A. Seamon, R. L. Galt, and H. S. Weber.

HENRY S. WEBER, *Secretary.*

COLORADO ENDURANCE RIDE

Ranger, half Thoroughbred, ridden by Ted Flynn and owned by Ed Pring, of Colorado Springs, took first place in the fourth Colorado Endurance Ride, 300 miles in five days of nine hours each. Vamp, half Thoroughbred and half Standardbred bay gelding, owned by Captain H. N. Beeman, of the Veterinary Corps of the Fort Riley Cavalry School, took second place, with Private Del Harris up. Third place went to Sgt. Thomas Garrity, of Fort Russell, Wyoming, who rode a United States Army horse, Tomahawk. He rode the horse down from Fort Russell—200 miles—arriving about a week before the ride. Though injured by a curb, the horse was started, and was so skillfully ridden as to improve every day of the ride. Norfleet, owned and trained by Major Henry Leonard, was ridden to fourth place by a 64-year-old cowboy, George Snurr. The performance of this horse was most remarkable, because he had only six weeks' training; had it been 90 days, there is every reason to believe he would have won first.

The horsemanship prize (for excellence in horsemanship regardless of where the horse finishes) went to Oliver E. Curtis, who rode his horse, a half Thoroughbred gelding, Colorado Boy, the full 300 miles to the finish, but whose horse was not quite good enough to land in the first four.

Sixty-four per cent of the starters finished in this year's Colorado ride. These rides are held to determine by actual test what kind and type of horses is best suited to long, arduous work under saddle, and to develop horsemanship in all the term denotes.

Six rides have been held in the East, and four in Colorado. In general aspects they are quite similar. All are held under controlled conditions over a measured 60-mile course, which is to be covered within nine hours. Before the first Colorado ride, in 1922, ranchmen and cowboys were inclined to scoff at the idea that it was difficult to cover 300 miles in five days. They called it a "dude" affair. Some of them entered the ride to show how easily it could be done. It was then they found that 60 measured miles were longer than 60 estimated miles over the plains.

Careful examinations of mounts before the ride and at the beginning and close of each day are developing many facts about horses of which ranchmen are already making use. They

have observed that horses which won were well-bred horses of riding strains—principally Thoroughbred: that they were of a type well suited to range work, yet could be sold as polo ponies, hunters, cavalry mounts, officers' chargers, or as three-gaited riding horses, according to the way they developed. With that quickness of decision so typical of Westerners, they began immediately to call for good sires. These, furnished by the Army Remount Service, are principally Thoroughbred, although there are a few Arabs and Standardbreds in use.

WAYNE DINSMORE, *Secretary,*
Horse Association of America.

THE NATIONAL HIGHWAY VETERINARY ASSOCIATION

The National Highway Veterinary Association met at Toledo Ill., Oct. 1, 1925. We are glad to report an excellent program and good attendance.

Interesting talks were offered by the following: Dr. Robt. Graham, University of Illinois, Urbana; Dr. A. T. Peters, Peoria; Dr. J. S. Koen, Bloomington; Mr. John Vandervort, Poultry Extension Specialist, University of Illinois; and Mr. Waldo Vickery, manager of the Wadley Produce Company, Mattoon.

Our next meeting will be held in January, at Marshall, Ill.

W. P. SHOAFF, *Secretary.*

ERRATA

Dr. Richard Ebbett, of Papillion, Nebr., directs our attention to the fact that the late Dr. Austin Peters, whose death notice was recorded in the report of the Committee on Necrology, published in the October issue of the JOURNAL, was a graduate of the Royal College of Veterinary Surgeons of London, April 2, 1885, in addition to being a graduate of the American Veterinary College, class of 1883.

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NECROLOGY

BRAYTON HOWARD RANSOM

DR. B. H. RANSOM

Dr. Brayton Howard Ransom, chief of the Zoological Division, Bureau of Animal Industry, United States Department of Agriculture, died in Washington, D. C., at 11:00 p. m. on September 17, 1925, after an illness of about three weeks. He was only forty-six years old, a comparatively young man, but in the short space of that brief lifetime he had crowded more of valuable achievement than most men may hope for in the Biblical allotment of three score years and ten. In the scope comprehended in his investigations he was quite unusual and in his grasp of the broad field of veterinary parasitology the writer would rank him next to the illustrious Railliet of Alfort, a much older man, retired from teaching a few year ago at the age of seventy.

It would be difficult to find another man who, on the scientific side, had done monographic systematic work on parasites and had established basic facts in the life histories of such important parasites as *Ascaris*, *Haemonchus*, *Strongyloides*, *Gongylonema*, *Habronema*, *Syngamus*, and *Taenia ovis*, and who, on the practical side, had first found in the United States many of our economically important parasites, had contributed to our knolwedge of the true pathological conditions or causes in the case of infestations with *Davainea echinobothrida*, *Cooperia punctata*, *Syngamus trachea* and *Ascaris lumbricoides*, had developed measures for the control of stomach worms in sheep and had originated and developed the famous swine sanitation system popularly known as the McLean County System, had developed the basic regulations of the United States Department of Agriculture for the control of parasites, especially trichinae and cysticerci, through the Meat Inspection Service, and had established some of the fundamental facts on which dipping for cattle ticks is based. Such a man has nothing to do with the debates on pure science versus applied science; he sees only the field of science and does well the tasks before him. The investigations noted above are

only the high lights selected from those represented in his bibliography of over 160 titles. This represents a quarter-century of productive work. His bibliography is devoid of padding. He was not a dabbler. His most prominent characteristics were his extreme thoroughness and carefulness. He was painstaking to a degree, in spite of the fact that the responsibilities of life weighed on him unusually heavily and that he paid an excessive toll of nervous energy for this painstaking work.

Dr. Ransom was born in Missouri Valley, Iowa, March 24, 1879, and educated in the public schools of Bancroft, Nebraska. He received the following degrees: S. B., University of Nebraska, 1899; M. A., University of Nebraska, 1900; Ph. D., University of Nebraska, 1908. It was proposed by the University of Nebraska to confer on him the honorary degree of D. Sc., at the June Commencement of this year, but owing to a misunderstanding he was unable to be present to receive the degree at that time. He was a Fellow in Zoology at the University of Missouri in 1900-1901 and at the University of Nebraska in 1901-1902. In 1902 he came to Washington as Assistant in Zoology in the Hygienic Laboratory of the U. S. Public Health and Marine Hospital Service and, the following year, succeeded Dr. Ch. Wardell Stiles in charge of the Zoological Laboratory of the Federal Bureau of Animal Industry. In 1906 he was made chief of the laboratory and the laboratory was at that time made the Zoological Division. As chief of this division he became Assistant Custodian of the U. S. National Museum.

His sound counsel and scientific achievements were widely recognized among scientific groups. He was U. S. delegate to the Seventh International Zoological Congress, the Fourth Fisheries Congress, and the First Pan-American Scientific Congress, and a member of the editorial boards of the *Journal of Parasitology* and the *American Journal of Tropical Medicine.* He was a member of the American Microscopical Society (president), American Society of Naturalists, American Society of Zoologists, American Association for the Advandement of Science (fellow), American Society of Tropical Medicine (secretary-treasurer), American Veterinary Medical Association (honorary), American Society of Parasitologists (councilor), Biological Society of Washington, Entomological Society of Washington, Helminthological Society of Washington (past president), Washington Academy of Sciences (vice-president), Société de Pathologie Exotique (foreign correspondent), Reale Accademia

d'Agricoltura di Torino (foreign correspondent), Phi Beta Kappa, Sigma Xi, Beta Theta Pi, and the Cosmos Club. In recognition of his work on ascarids he recently had conferred on him the Gold Medal of the Seamen's and Tropical Diseases Research Association of Kobe, Japan.

As an executive Dr. Ransom was a man of vision in his attitude towards his problems and just, considerate and generous towards his associates in the laboratory. Although an outstanding figure himself, nevertheless he did not believe in the policy of a one-man laboratory, consisting of a head surrounded by "dieners," and preferred to surround himself with scientific associates rather than with personal assistants. Under his supervision the Zoological Division has had a steady and healthy growth from the time he took charge in 1903, and at the time of his death Dr. Ransom had a technical staff of six associates at Washington and four technical associates in charge of as many field projects at various places in the United States. His death is a personal loss to all his staff. They were devoted to his interests, deeply concerned when his health and life were imperilled, and have maintained throughout a high morale consistent with the obligations imposed by his kindly treatment and intelligent supervision.

What has been said of Dr. Ransom as a scientist and executive implies correctly what may be said of him as a man and as a friend. He did not maintain one attitude in his professional and executive capacity and another in his personal relations. In all his relationships he was uniformly courteous, kindly, helpful and considerate, and these qualities, coupled with a certain personal charm, ensured him the regard and admiration of all who knew him. It was developed during his last illness that he had many troubles and burdens which he kept to himself, and it is the one regret of his many friends that they could not have shared or lightened these burdens. With a dignified and quiet reserve he carried these to the end by virtue of an extraordinary strength of mind and fineness of character. That this man should have fallen beneath his burdens in the prime of life and achievement is a tragedy. The only consolations of his friends are that he leaves an unblemished record and that it is not always an unkindly fate that one is spared the vicissitudes of old age and the uncertainties of life. Whatever there may be of reward for life well spent, work well done, and service to humanity—that reward is his.

M. C. H.

GEORGE ARTHUR LIPP

Dr. George A. Lipp passed away very suddenly at his home in Roswell, New Mexico, June 25, 1925. Death was due to fatty degeneration of the heart.

Born in Petersburg, Ohio, January 23, 1880, Dr. Lipp attended the public schools of his community, and later entered the Ohio State University, from which he received his veterinary degree in 1904. He immediately entered the service of the Bureau of Animal Industry, which connection he maintained up until the time of his death. He was transferred to Roswell, N. Mex., his final assignment, in 1906.

Dr. Lipp joined the American Veterinary Medical Association in 1910, and served as Resident Secretary for New Mexico for a number of years. For four years, Dr. Lipp was Secretary-Treasurer of the National Association of Bureau of Animal Industry Veterinarians. He was a member of Roswell Lodge No. 18, A. F. &. A M.; Columbia Chapter No. 7, Rio Hondo Commandery; Ballut Abyad Shrine of Albuquerque, New Mexico; and Modern Woodmen of America.

He is survived by his widow, one son, two daughters, four sisters, and two brothers, the latter being Dr. C. C. Lipp, of Brookings, S. D., and Dr. C. F. Lipp, of Leland, Miss.

J. D. KING

Dr. J. D. King, of Canal Winchester, Ohio, died at his home, September 26, 1925. Death was due to pernicious anemia. Dr. King was born and raised in Franklin County, Ohio, and lived there nearly all his life. He was a graduate of the Ontario Veterinary College, class of 1899. He is survived by his widow, three sons, one daughter, and three sisters.

JOSEPH KIME

Dr. Joseph Kime, of Chatham, Ontario, died October 11, 1925, following a paralytic stroke the day before. He was born in England 55 years ago, and had been a resident of Chatham for nearly 40 years. He was graduated from the Ontario Veterinary College in 1893, and for a time was a veterinary inspector under the Contagious Diseases of Animals Act. He is survived by his widow, a daughter, and three brothers.

OLE LARSON TESDAL

Dr. O. L. Tesdal, of Rochelle, Ill., died September 26, 1925, following an operation which he underwent one week previously.

Born in Norway, April 8, 1870, Dr. Tesdal came to America at the age of eighteen. He first entered the McKillip Veterinary College, and was graduated in 1910. He practiced at Wheaton, later at Lee, and then entered the Chicago Veterinary College, from which he was graduated in 1917. Since that time, he practiced at Rochelle, Ill.

Dr. Tesdal joined the A. V. M. A. in 1917. He was also a member of the Illinois State Veterinary Medical Association. He is survived by his widow and four sisters.

HOWARD BRENEMAN BRADY

Dr. H. B. Brady died suddenly, September 30, 1925, at his home in Lancaster, Pa. Death was due to coronary thrombosis.

Born December 25, 1881, in Safe Harbor, Pa., Dr. Brady received his veterinary training at the Ontario Veterinary College, from which he was graduated in 1906, and at the McKillip Veterinary College, from which he received his degree in 1907. He immediately located in Lancaster, Pa., where, through his untiring efforts and conscientious devotion to his profession, he established a highly successful and extensive practice. His kind ways and lovable disposition endeared him to all who knew him, and his untimely death was a blow to the entire community.

Dr. Brady joined the A. V. M. A. in 1917, and was a member of the Pennsylvania State Veterinary Medical Association, the Conestoga Veterinary Club, Lancaster Lodge, No. 43, F. & A. M., the Tall Cedars of Lebanon, and the Emanuel Lutheran Church, of Lancaster, Pa. He is survived by his widow, one son, two daughters, one brother, and one sister.

WALTER D. COWAN

Dr. Walter D. Cowan, of Galt, Ont., died suddenly at his home, October 15, 1925, of pneumonia. He was in his 61st year. Dr. Cowan was a graduate of the Ontario Veterinary College, class of 1890, and had an extensive practice in western Ontario. He was well known throughout the length and breadth

of Waterloo County and was considered an expert judge of horses, being one of the chief promoters of the Manchester racing track, at Galt. As a member of the profession he was highly esteemed. He is survived by his widow and three sisters.

HARRY FREDERICK

Dr. Harry Frederick, of Westtown, N. Y., committed suicide by shooting, July 3, 1925. Dr. Frederick was born at Suffern, N. Y., and was graduated from the New York State Veterinary College at Cornell University, class of 1910. He practiced at Suffern for a time and saw military service during the war, after which he located at Westtown, where he conducted a successful general practice.

Dr. Frederick joined the A. V. M. A. in 1911.

MRS T. P. WHITE

Our sympathy goes out to Dr. T. P. White, of Washington, D. C., in the death of his wife, Sarah Elizabeth White, October 11, 1925, in a Washington hospital. Mrs. White had many acquaintances among the members of the profession, who will be shocked to hear of her death.

MRS. B. H. BROOKS

On July 31, 1925, Mrs. B. H. Brooks, wife of Dr. B. H. Brooks, Riverton, Ia., passed away, leaving an infant son, Warren Perry. Members of the Southwestern Iowa Veterinary Association served as honorary pallbearers. The hundreds in attendance at the funeral services silently attested the respect of the community for the departed and their sympathy for Dr. Brooks.

MARRIAGES

Dr. James A. McKitterick (K. S. A. C. '22), of Greenwood, Mo., to Miss Dorothy Sue Sechler, of Kansas City, Kans., April 25, 1925.

Dr. John W. Van Vliet (K. S. A. C. '22), of Brookings, So. Dak., to Miss Maude Powell, of Kansas City, Kans., August 12, 1925.

Dr. M. A. Nevens (Corn '24), to Miss Nellie Mason, at Ithaca, N. Y., August 25, 1925.

Dr. D. M. Swinehart (O. S. U. '10), of Columbus, Ohio, to Miss Cretora Enslen, of Elida, Ohio, October 3, 1925.

Dr. William Marshall Coffee (Ind. '18), of La Center, Ky., to Miss Ethyle Leigh Moore, October 8, 1925.

BIRTHS

To Dr. and Mrs. J. W. Benner, of Ithaca, N. Y., a son, James William, Jr., July 19, 1925.

To Dr. and Mrs. L. L. Herman, of Williamsville, N. Y., a daughter, Betty, August 15, 1925.

To Dr. and Mrs. Raymond D. Connelly, of Lima, Pa., a daughter, August 15, 1925.

To Dr. and Mrs. C. H. Honeywell, of Slater, Mo., a son, Charles Leo, September 9, 1925.

To Dr. and Mrs. F. R. Beaudette, of New Brunswick, N. J., a son, Robert Rader, September 13, 1925.

To Dr. and Mrs. A. F. Burger, of Alta, Iowa, a son, August F., September 22, 1925.

To Dr. and Mrs. F. K. Hansen, of Marquette, Mich., a son, George J., September 27, 1925.

To Dr. and Mrs. H. B. McMurray, of Ithaca, N. Y., a son, Harold Glen, September 29, 1925.

PERSONALS

Dr. C. D. Bashore (Cin. '15) has located in Shelby, Ohio.

Dr. R. C. Dickson (K. C. V. C. '18), of Fayette, Mo., has located at Corder, Mo.

Dr. Peter Garside (Chi. '10), of Bourbon, Ind., is now at Daytona Beach, Florida.

Dr. W. E. Russell (Chi. '20) has removed from Lowell, Wis., to North East, Pa.

Dr. M. A. Taylor (Ind. '12), formerly of Mattoon, Ill., has located at West Salem, Ill.

Dr. L. C. Pelton (Corn. '12), recently of Seattle, is now located at Enumclaw, Wash.

Dr. O. H. West (St. Jos. '19), formerly of La Belle, Mo., has located in Kirksville, Mo.

Dr. Wm. E. Williams (K. C. V. C. '17) has removed from Weldona, Colo., to Fort Collins.

Dr. F. A. Boies (K. C. V. C. '14), formerly of Pisgah, Iowa, has removed to Logan, Iowa.

Dr. John O. Hart (McK. '07), of Winchester, Ind., has opened an office at Ridgeville, Ind.

Dr. B. H. Branson (Ind. '11), of Waveland, Ind., has taken up the study of human medicine.

Dr. C. V. Noback (Corn. '11) is now with the New York State Department of Health, Albany, N. Y.

Dr. F. J. Reamsnyder (T. H. '14) has requested a change of address from Troy to Union City, Tenn.

Dr. G. W. Lewallen (A. P. I. '11), of Columbus, Ga., gives a new address in St. Petersburg, Fla., 318 12th Ave. N.

Dr. L. W. Klene (San. Fran. '18), formerly of Elgin, Arizona, is now in Los Angeles, Calif. Address: 4425 Marmion Way.

Dr. Chas. H. Atkinson (Wash. '20) has been transferred from Oakdale to Ripon, Calif., with the State Department of Agriculture.

Dr. S. D. Graumlich (O. S. U. '11), who has been in practice at Lockbourne, Ohio, for about ten years, recently removed to Circleville, Ohio.

Dr. B. W. Conrad (K. C. V. C. '07), of Sabetha, Kans., was slowly recovering from his recent attack of illness, according to the latest report.

Dr. E. R. Carlson (Mich. '25) will remain at the Michigan State College, as a member of the staff of the Department of Animal Pathology.

Dr. E. R. Steel (Corn. '14), chairman of the Section on General Practice, was confined to his home with an attack of sciatic rheumatism the past month.

Dr. C. B. McGrath (Iowa '23), of Tekamah, Nebr., has accepted a position on the staff of the College of Veterinary Medicine, State College of Washington, Pullman.

Dr. H. W. Brown (Ind. '23), secretary of the Section on Small Animal Practice, who has been in Portland, Oregon, the past year, has returned to Monrovia, Ind.

Dr. John R. Berggren, (Chi. '13), of New Richmond, Wis., attended the recent meeting of the Inter-State Post Graduate Assembly of America, held in St. Paul, Minn.

Dr. M. H. Mabey (Corn. '17) has returned to private practice at Cuba, N. Y., after a year's work on the faculty at the New York State Veterinary College, at Ithaca.

Dr. Frank J. Brands (McK. '12), of St. Henry, Ohio, has relinquished his practice to accept a position in the Meat Inspection Division of the B. A. I., at New York, N. Y.

Dr. E. A. Caslick (Corn. '22) has resigned his position at the University of Kentucky, and is now private veterinarian for Mr. E. B. Hancock, a breeder of fine horses.

Dr. H. B. McMurray (Corn. '24) has given up his practice at De Ruyter, N. Y., to accept a position in the Department of Surgery, at the New York State Veterinary College.

Dr. A. L. Delez (Colo. '25) has accepted a position in the Department of Animal Pathology of Michigan State College. He will devote his time to research in animal diseases.

Dr. S. H. Kesten (McK. '14), of Winnipeg, Man., was recently appointed a veterinary inspector in the Health of Animals Branch, Dept. of Agriculture, and stationed at Winnipeg.

Dr. Frank Nisley, Jr. (U. P. '18), of Middletown, Pa., is reported to be making a satisfactory recovery from an anthrax infection which he contracted while making a postmortem.

Dr. C. J. Koon (K. S. A. C. '24), of St. Augustine, Fla., has accepted a position in the Department of Zoology and Animal Pathology, Virginia Polytechnic Institute, Blacksburg.

Dr. E. R. Derflinger (O. S. U. '15), assistant state veterinarian of Oregon, has requested that his JOURNAL be sent to him at Junction City, Ore., instead of Eugene, until further notice.

Dr. J. N. Frost (Corn. '07), E. Sunderville (Corn. '08), and E. L. Brunett (Corn. '23) were in charge of the exhibit of the N. Y. State Veterinary College, at the recent New York State Fair, at Syracuse.

Dr. Ching Sheng Lo (K. S. A. C. '23), who has been connected with the National Southeastern University, at Nanking, China, is now at the Third Agricultural College, Tsing Kiang Pu, Kiangsu, China.

Dr. George A. Dick (U. P. '04), professor of animal industry, University of Pennsylvania, addressed a recent meeting of the Rotary Club of Kane, Pa., on "The Past, Present, and Future of the Veterinary Profession."

Dr. Frank Hare (K. S. A. C. '20), whose appointment to a newly created position in Delaware was announced in the October JOURNAL, received the degree of Master of Science from Cornell University early in the summer.

Dr. Walter G. Hollingworth (Amer. V. C. '84), of Utica, N. Y., has been elected the first president of the newly organized Utica Zoological Society. The three-fold purpose of the Society is to educate, give pleasure, and conserve.

Dr. W. T. Johnson (Wash. '17), formerly at the Western Washington Experiment Station, has accepted the position of poultry pathologist, in the Department of Veterinary Medicine, Oregon Agricultural College.

Dr. E. L. Reed (U. S. C. V. S. '11) has severed his connection with the Florida State Live Stock Sanitary Board, to accept the position of veterinarian to the Health Department of Pensacola, Fla., in charge of milk and meat inspection.

Dr. William Wolf has succeeded Dr. Rufus B. Blume (U. S. C. V. S. '07) as chief food inspector of the Health Department of Cincinnati, Ohio. Dr. Blume resigned recently to go to Miami, Fla. Dr. Wolf was formerly a deputy in the Department.

Dr. R. H. Aull (Iowa '15), of Dayton, Ohio, accompanied by Mrs. Aull, took an extended trip through the northern part of Ohio and New York recently. They visited a number of the leading veterinary hospitals, en route, in addition to taking in the scenic beauties.

Dr. J. P. Molloy (Ont. '02, McK. '03), of Morris, Man., at one time a veterinary inspector in the Health of Animals Branch, at Ottawa, Canada, was recently appointed to the distinguished position of Senator, as a representative to Ottawa from the province of Manitoba.

Dr. J. R. Seipel (K. C. V. C. '08), of Poplar Bluff, Mo., recently returned home from a hospital in St. Louis, where he underwent an operation for removal of both his gall-bladder and his appendix, on August 22. Dr. Seipel wrote under date of October 7, that he was rapidly regaining his health, and felt better than he had felt at any time during the past four years.

Dr. Hubert Shull (Ont. '16), of Texarkana, Ark., attended the recent meeting of the Health Workers of Texas, at Waco. Dr. Shull has been a vice-president of this organization for some time and was re-elected for another term. He was also selected to represent the organization at the annual meeting of the American Public Health Association, in St. Louis, in October.